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THE WINEMAKER'S TECHNICAL JOURNAL

November-December 1982

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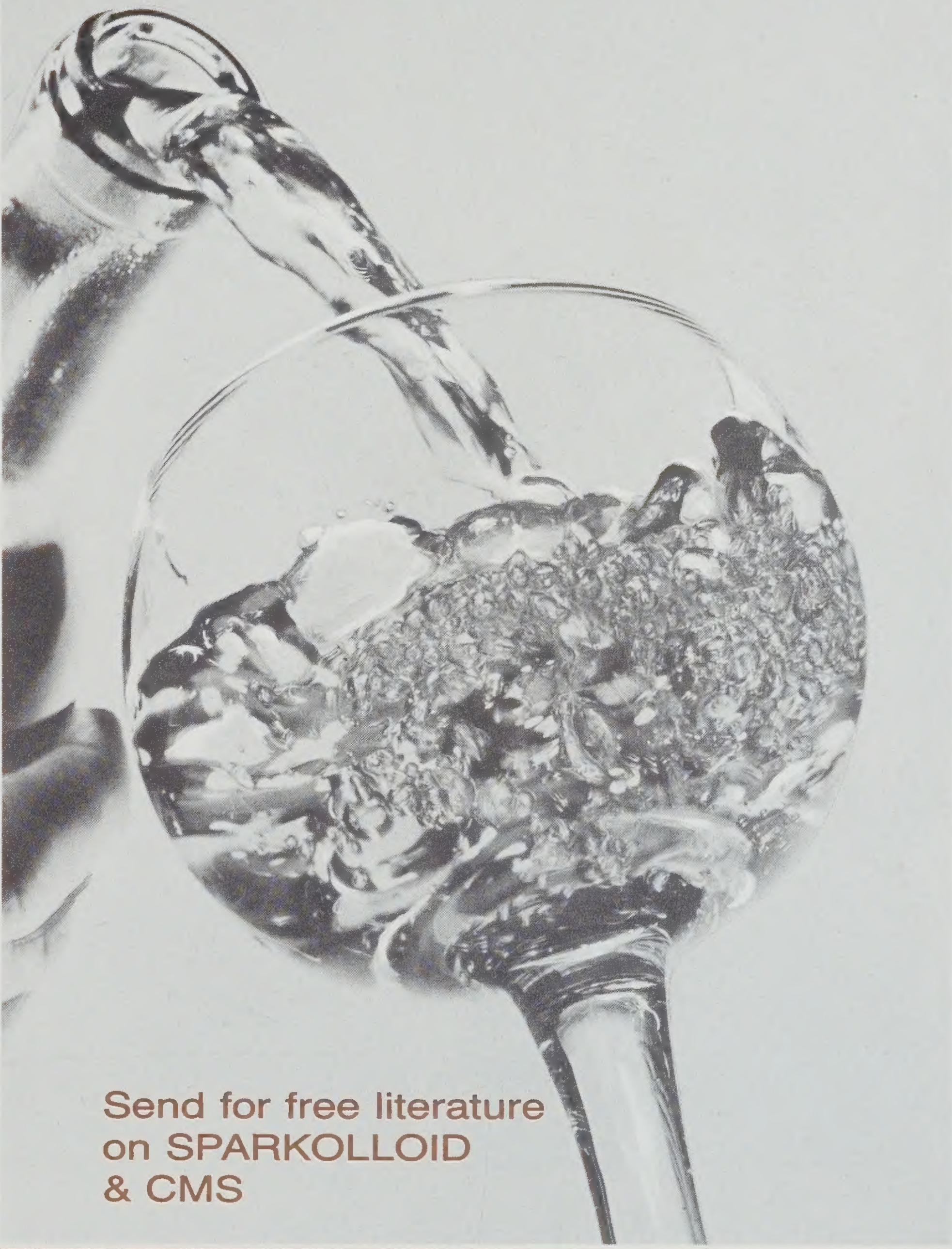

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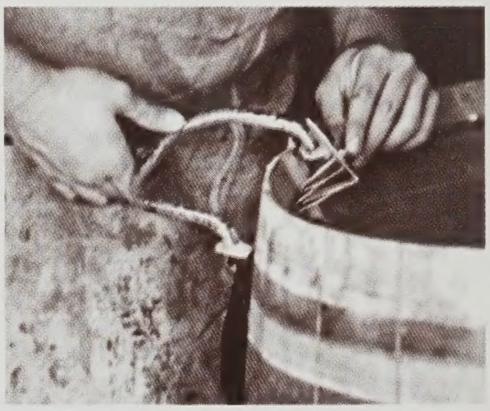

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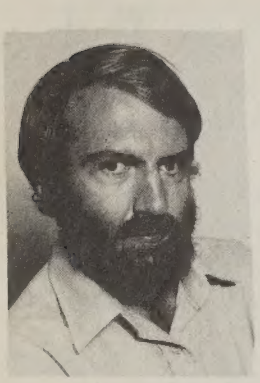

FREE RUN

This issue completes my first year of publishing Practical Winery. Many changes have been made and many of you have commented favorably on them. Thank You! I welcome Scott, Nancy, and Elizabeth and their contributions to the continuing improvement of the journal.

Two stories in this issue deserve extra emphasis here:

Fining Agents: There are no simple applications for the agents. I repeat statements from users, suppliers and independent laboratories—Do fining trials and find out what different agents might do to a given wine. Keep records and conduct trials on different wines over several years to develop a data base.

Part Two—Fining Agents, next issue, will have Bruce Rector of Napa Valley School of Cellaring explaining fining trials. The journal will organize some fining trial tastings and report observations of participants in upcoming editions. You are invited to submit fining questions that the journal might conduct a trial on and report the observations.

Bottles: There is an incredible number of choices for the winemaker! There seems to be no industry-wide or governmental standard except for the space for the liquid inside.

Therefore, the color, the bead and exact shape may not be identical between manufacturers. I highly recommend that you get samples far in advance of bottling to check the volume fill with your desired length of cork and check your capsule for fit on the bead and neck!

The Bottle Guide is pretty accurate, I hope, at press time. New shapes and colors continue to be introduced. Not all shapes or sizes may be on the chart, but the most common ones are. Many thanks to the vendors who cooperated to make the listing!

I am looking forward to my trip east and hope to learn as much as possible of the challenges and problems facing eastern winemakers!

Story notes: The barrel phenolic extraction report promised in this issue was pushed back to January-February—lack of room.

The Chenin Blanc varietal analysis is complete for January-February including a complement of tasting descriptor notes of six winemakers on the eleven wines.

Coming up soon: California Merlot, Chardonnays from East and West USA, California Pinot Noir, more California Sauvignon Blanc, and I hope to look at Rieslings from east and west next year!

— DON NEEL —

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PRACTICAL WINERY
November-December 1982
Volume III, No. 4

FEATURES

O'Enologist 7
WITS 8
Malolactic Fermentation by Wayne Marcil 9
Bottle Buyer's Guide 13
Glass Manufacturing Quality 17
Used Bottle Supply 18
Buyer's Guide to Fining Agents 20
Fining Agents Purchasing Guide 22
Pinot Noir 26
Ahlstrom Redesigns Coq Cylinder 38

DEPARTMENTS

Education & Research 39
Barrels and Wine 40
Past Issues 42
Index of Advertisers 44
Reader Service Response Form 44
Services for the Winemaker 45

COVER: Sample of bottles available to winemakers photographed on the filler of Kenwood Winery, CA.

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HARVEST OF REPORTS IN **PRACTICAL WINERY** FOR THE YEAR OF 1982

SUBJECT	ISSUE
Barrels-Coopers and Brokers	May-June
Barrel Shaving	July-August
Barrel Phenolic Extraction	November-December
Bottle Buyers Guide	November-December
Chardonnay Varietal Analysis	May-June
Acacia, Chateau St. Jean, Grgich-Hills, Kistler, La Crema Vinera, Charles Ortman, Sonoma Vineyard	
Computers	
California Wineries	January-February
Kenwood Winery, CA	March-April
Ridge Winery, CA	May-June
Fenn Valley Winery, Michigan	September-October
Consultants Help Winemakers	May-June
Corks—Vendors and Winery Quality Control	March-April
Fining Agents Buyers Guide	November-December
Insulated Tank Benefits	July-August
Laboratories (Independent) Offerings to Production Wineries	May-June
Lees Filter-Press	May-June
Malolactic Fermentation	
Al Cribari	March-April
Wayne Marcil	November-December
Nouveau Production in California	January-February
Pinot Blanc Varietal Analysis	September-October
Chalone, Congress Springs, Fetzer, Jekel, J. Lohr, Wente Bros.	
Pinot Noir Varietal Analysis	November-December
Amity, Associated Vintners, Elk Cove, Eyrie, Knudsen-Erath, Oak-Knoll, Ponzi	
Portable Bottling Lines	January-February
Refrigeration: Calculate Cooling Load	September-October
Glycol and Ammonia	November-December
Roto-Tanks	September-October
Sauvignon Blanc Varietal Analysis	July-August
Callaway, J. Carey Cellars, Dry Creek, Montevina, Preston (CA), Joseph Phelps, Sokol Blosser, Sterling, Stonegate, Ventana	
Secondary Closures Buyers Guide	July-August
Silicone Barrel Bungs	March-April
Skin Contact Temperature Variation	September-October
Steel Barrel Rack Buyers Guide	March-April
Tank Press	January-February
Used Wine Bottles	November-December
Variable Capacity Tank	July-August
Wastewater Disposal	March-April
Departments	
Barrels & Wine by Denis Kelly	
Kenwood wine/barrel combinations	September-October
Port in Barrels	November-December
Berkeley Wine Cellars, Quady, Woodbury	
Education & Research	
Fresno State	January-February
Oregon State	March-April
Missouri	September-October
New York	November-December
Marketing	
Ray Krause	January-February
Ralph Montali	March-April
Patrick Dore	May-June
Alfred Barson	September-October

The list above speaks for the focus and direction of **PRACTICAL WINERY.** Our readers regularly testify to the quality and depth of reporting.

It is our goal to become **the** journal for the wine industry providing in depth reporting on the intricacies of winemaking in a fresh and readable format.

The 1982 back issues of **PW** are available for $5.00 each (this includes postage). Please mail your request together with your payment.

Everyone with more than a cursory interest in winemaking should be reading this journal. Subscribe now.

Find your subscription reply form on page 44.

The Very Model of a Modern O-enologist

(To the tune of "The Very Model of a Modern Major-General," from *The Pirates of Penzance*, by Gilbert & Sullivan.)

I am the very model of a modern o-enologist,
I've information making me a leading winocologist.
In vineyard lore I must admit I am a grape historian,
And well aware of diff'rence in varieties Californian.

(Chorus):
In vineyard lore he must admit he is a grape historian,
And well aware of diff'rence in varieties Californian.

I distinguish instantaneously the Zinfandel from Cabernet;
My palate's finely tuned to the subtilities of Chardonnay.
I use the Davis Scorecard and I taste organoleptically:
Swallow? No! I spit it out, (but do it antiseptically.)

(Chorus);
He'll use the Davis Scorecard and he'll taste organoleptically:
Swallow? No! He spits it out, (but does it antiseptically.)

My vocabulary's brimming with sophisticated words of wine,
Although it may be true that the description is absurd at times.
I rate each wine I taste in cultured snobbish lexicology,
And banters terms like "breeding," "nose," and "dumb" without apology.

(Chorus):
He rates each wine he tastes in cultured snobbish lexicology,
And banters terms like "breeding," "nose," and "dumb" without apology.

I am also well acquainted with advances technological:
I read the journals quarterly for treatments chemistrogical,
Like plastering, or sulfiting, detecting ethyl acetate,
And learn the latest sanctions on diethylpyrocarbamate.

(Chorus):
Like plastering, or sulfiting, detecting ethyl acetate,
He learns the latest sanctions on diethylpyrocarbamate.

I'm adept as well with wine in matters microbiological:
I've listened to professors, be they young or old and stodgical.
I know the sexual habits of the well-known Ascomycetes,
And how to keep away from all Acetobacter crisesies.

(Chorus):
He knows the sexual habits of the well-known Ascomycetes,
And how to keep away from all Acetobacter crisesies.

I've memorized the wine laws from the governmental agency
Of bureaucratic revenuers, just, intrepid, sage 'n free.
I understand it all except for one thing where I must show lack:
Please tell me what wine has to do with guns, explosives and tobac'.

(Chorus):
He understands it all except for one thing where he must show lack:
Please tell me what wine has to do with guns, explosives and tobac'.

So when to grapes it comes I show expert epistomology,
From vine to glass I am a whizz at vinous philosophistry.
I have the well-bred background of a Davis Fermentologist,
In short, the very model of a modern o-enologist!

(Chorus):
He has the well-bred background of a Davis Fermentologist,
In short, the very model of a modern o-enologist!

WAYNE MARCIL
December, 1981

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WITS Conclave Opens Jan. 28

An opportunity for winemakers and vineyardists to discuss common problems in enology and viticulture will be the focus of the Ninth Wine Industry Technical Seminar (WITS) opening Jan. 28 at the San Jose Hyatt Hotel.

The two-day event will feature a keynote address by Stephen Higgins of Washington, D.C., acting head of the Bureau of Alcohol, Tobacco and Firearms (BATF), on Saturday, Jan. 29. His topic will be on the international aspects of BATF activities.

The customary one-day seminar has been expanded to include a session on marketing techniques for winemakers. This program will open the seminar Friday, Jan. 28, at 2 p.m. Ed Everett, publisher of the California Wine Merchants' Gazette and a marketing expert, will coordinate the session.

The Saturday program will begin at 9 a.m. and feature talks by academicians, vineyard researchers and winemakers.

Among those scheduled to speak are Dr. Dewey D.Y. Ryu, the Amerine Professor of Viticulture and Enology at UC-Davis; Nick Dookoozlian of California State University, Fresno; John Senkevich of Geyser Peak Winery and UC-Davis Professors Ralph Kunkee, Glenn Williams and Curtis Alley.

Others include marketing specialist Gerald Asher of Foremost-McKesson and Darrell Corti of Corti Brothers, Sacramento.

Topics to be discussed include "Good Yeasts and Bad," "Future Trends in Fermentation Technology," "New Aspects of Wine Packaging," "The Basic Technology of Low Alcohol Wines," "The pH Factor in Winemaking" and "New Techniques in Training Vines."

In addition, a panel of experts will discuss "Replacement for DBCP in Nematode Control in the Vineyard."

Jefferson E. Peyser will be honored as the WITS Leon D. Adams Achievement Award winner at a 7 o'clock dinner Friday. Peyser will be cited for his outstanding contributions to the wine industry.

Registration forms for the two-day event will be mailed shortly, according to Julius L. Jacobs, WITS Council secretary. Registration will also be taken beginning at 8:15 a.m. on Saturday, Jan. 29, he said. ■

SECONDARY CLOSURE ADDITION

RAMONDIN OPENS USA OFFICE

Ramondin S.A., manfacturers of quality bottle capsules has opened a direct sales and warehouse operation in the United States. Serving the international market since 1890 from their production facilities located in Logrono, Spain, Ramondin produces tin-lead wine and champagne capsules, complex aluminum wine and champagne capsules, and PVC heat shrink capsules.

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Malolactic Fermentation Adds Stability, Complexity & Softness

By WAYNE MARCIL

Wine consumers today are becoming more and more conscious of the various technical aspects of winemaking. Most wine buffs are aware that wine is made by a process catalyzed by yeast enzymes, known as "alcoholic fermentation" whereby the sugar of grape juice is converted to the alcohol—along with numerous fermentation by-products—of wine.

There is another very important fermentation, quite common in winemaking, however, with which the consumer may not be so familiar. This is the "malo-lactic fermentation" (ML or MLF for short).

The MLF is the stoichiometric decarboxylation (i.e., removal of carbon dioxide) of the L-malic acid naturally occurring in must and wine, to lactic acid. The fermentation takes place through the enzymatic action of the lactic acid group of bacteria, notably the genera *Lactobacillus, Pediococcus,* and *Leuconostoc.* This is the same family of bacteria used in the production of sauerkraut, cheese, yogurt and sourdough bread.

The reaction is: (Malic acid) $COOH\text{-}CHOH\text{-}CH_2\text{-}COOH \longrightarrow$ (Lactic acid) $COOH\text{-}CHOH\text{-}CH_3$ + (Carbon dioxide) CO_2, the active enzyme being L-malic NAD carboxylyase, or simply, "malo-lactic enzyme." The reaction is believed to occur via a pyruvic acid intermediate with a small net increase of NADH. It is an anaerobic process (i.e., it preceeds in the absence of oxygen.)

From the winemaker's point of view, there are three major effects of the MLF.

First and most obvious, and probably most important, is that the fermentation is an acid-reducing (pH increasing) process. Malic acid is generally the second-most prevalent acid in grapes (after tartaric) and is relatively strong as fruit acids go. (It is the predominant acid of apples, whence its name.) During the MLF, the two carboxylic acid (COOH) groups of malic acid are converted to the single one of lactic acid.

In addition, the dissociation constant of malic acid is greater than that of lactic acid (malic: $Ka_1 = 4.0x10^{-4}$; lactic: $Ka = 1.37x10^{-4}$.) Since lactic acid provides fewer protons and is less dissociated than malic, the effect on the wine of the MLF is a reduction in titratable acidity and an increase in pH. The MLF, therefore, is a *de-acidification* process.

A second, and more subtle, effect of the MLF is that of increased *complexity* of the wine due to the volatile by-products of the fermentation. These are not well-documented but may include diacetyl, aldehydes, H_2S (indirectly through yeast) and others. In high concentrations these would certainly be spoilage products, but in the very small amounts in which they are produced they apparently serve to add a subtle complexity to the wine, especially the richer, more tannic reds.

The third effect of the MLF is that of *microbiological stability.* Once the fermentation has occurred, the wine is immune to that particular activity happening again later in the bottle, something that tends not to particularly endear a winery to its customers. With few exceptions, a dry wine that has undergone malo-lactic fermentation will not require sterile membrane filtration before bottling.

On the other hand, even though the MLF may render the wine malo-lactically stable, the resultant increase in pH might actually encourage other types of instability. After completion of the MLF, the vintner generally needs to increase the level of SO_2 in the wine and might also have to re-assess his fining requirements.

Winemakers are often faced with the decision of whether or not to encourage the MLF. It is generally encouraged for several reasons:

First, when conditions are such that the fermentation is likely to occur anyway, it is preferable to "get it over with" as soon as possible to allow the wine to stabilize. A wine of medium to high pH, a high malic acid content, a high nutrients content, low in SO_2, and kept at a fairly warm temperature would be highly conducive to the MLF.

Another reason for encouraging the MLF is to lower the acidity of the wine. This is particularly important in cold viticultural regions such as Burgundy, Bordeaux and Champagne where the cool growing season produces grapes high in malic acid. The Germans, with their even cooler season, could also well employ the MLF; however for a variety of reasons they generally tend to shy away from it.

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A third reason would be the increased complexity mentioned earlier. This is more pronounced in dry red wines, and most "premium" reds with some barrel age will have undergone the MLF.

White wines as a rule do not benefit from the malolactic. Generally a crisper, fruitier, more acidic style for whites is favored, and the MLF would detract from this. In addition, white grapes often come in at a low pH, higher amounts of SO_2 are used, and early pressing and racking deplete nutrients essential for the fermentation, all of which discourage the MLF from occurring. An exception among the whites is often Chardonnay.

"Late-harvest" wines are also sometimes recalcitrant in completing the MLF. In late-harvest grapes, much of the malic acid is respired before picking. The high alcohol and/or residual sugar content, the lower nutrient levels (the yeast having used up more during their prolonged fermentation) and the generally higher SO_2 levels maintained in wines with residual sugar also serve to discourage the MLF.

SILVERADO VINEYARD, Napa, CA, has installed the first Cobert model Olympia, 16 spout filler in the USA manufactured by Bertolasso in Cinella, Italy. The low vacuum, gravity filler has a capacity of 50 bottles/minutes. Cobert fillers have all stainless steel contact parts for easy and complete sanitation and sterilization. Cobert offers complete vacuum regulation by a unique valving system. Fillers are available with 12-105 spouts built in a monoblock or synchro-block with Bertolasso corking and capping machines according to fp Packaging, Inc., USA distributor. Call fp Packaging at (415) 871-5497 or fill in PW reader response card.

To encourage the MLF the winemaker can use commercially prepared pure ML culture, usually of the *Leuconostoc* genus. Traditionally, and still today in many cases, the "normal flora" of the winery is relied on to inoculate the wine with ML organisms. By using minimal SO_2, delaying racking to increase micro-nutrient levels, and not chilling, the ubiquitious organisms are given a hopeful pat on the back.

Although this spontaneous fermentation may occur concurrently with the alcoholic fermentation, traditionally it takes place in the spring when the cellar warms up. It is during this "spring fermentation" that the wine once again "comes alive," as concommitantly flowers bloom, sap rises, young mens' fancies turn, and virgins—if any can be found—are sacrificed. It is a time to be joyous and gay. The wise vigneron also loosens his bungs.

By using the pure cultures, however, some of the risk of a bad fermentation (i.e., off-odors and tastes) from wild ML strains is removed. There is also less need for the practice of delaying rackings, etc., which might promote other types of spoilage. Just as in the case of yeast, it is probably wise to inoculate with a pure culture to increase chances for a "clean" fermentation, or indeed, for a fermentation at all. Even so, it must be noted that the organisms are rather fastidious and will be reticent to propegate in a wine of very low pH,high SO_2, or kept very cold.

The MLF is undesirable under several conditions. If it occurs in a low-acid wine, reducing the acidity even further, the wine could become flat, flaccid, dull in color, uninteresting and prone to further spoilage. In such a case, acid adjustment would probably be necessary.

An extremely undesirable condition is for the fermentation to occur after the wine has been bottled. In this case, the wine would become gassy, since CO_2 is evolved, and turbid from the growth of bacterial cells. Off-odors might also be produced. In Portugal, "Vinho verde" wines are purposely made this way, but this is an exception.

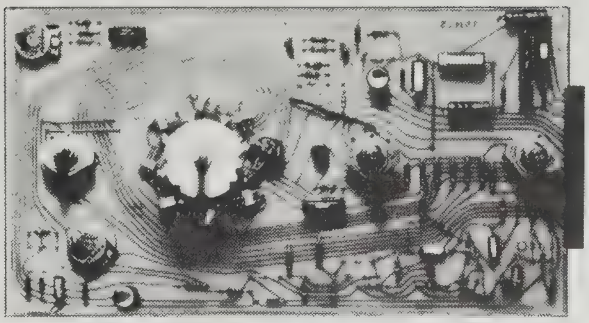
A particularly insidious case of malo-lactic spoilage can occur in (generally non-premium) wines to which sorbic acid has been added to prevent yeast growth. Sorbic acid has little or no effect on bacteria and if the wine undergoes malolactic fermentation in the presence of sorbate, the following reaction may occur: $COOH-CH=CH-CH=CH-CH_3$ (sorbic acid) $CH_3-CHOC_2H_5-CH=CH-CH=CH_2$ (2-ethoxyhexa-3, 5-diene). This reaction product has a characteristic "geranium" off-odor and can be quite unpleasant.

The occurrence of the MLF can be measured semi-quantitatively in the lab by a simple paper-chromatography procedure (reference Kunkee article). Quantitative enzymatic assays are also available (reference P.W. articles on wine labs). It is very important for the winemaker to know the malo-lactic status of his wines at any given time. After completion of the MLF, the wine usually needs some time to settle down (i.e., to dissipate the temporary lactic off-odors and CO_2). A racking is also in order.

Consumers, then, should be aware of the connotations of the MLF. Generally, most Bordeaux, Burgundies and "premium" American red table wines as welll as many of the richer Chardonnays will have undergone this secondary fermentation. Wine is de-acidified, usually "softened" somewhat, possibly made more "complex," and partially stabilized by this bacterial activity. ■

The author wishes to thank Enological Testing Service, Bob Kozlowski and Lisa van der Water for their assistance.

New Vaslin Electronic Control Center



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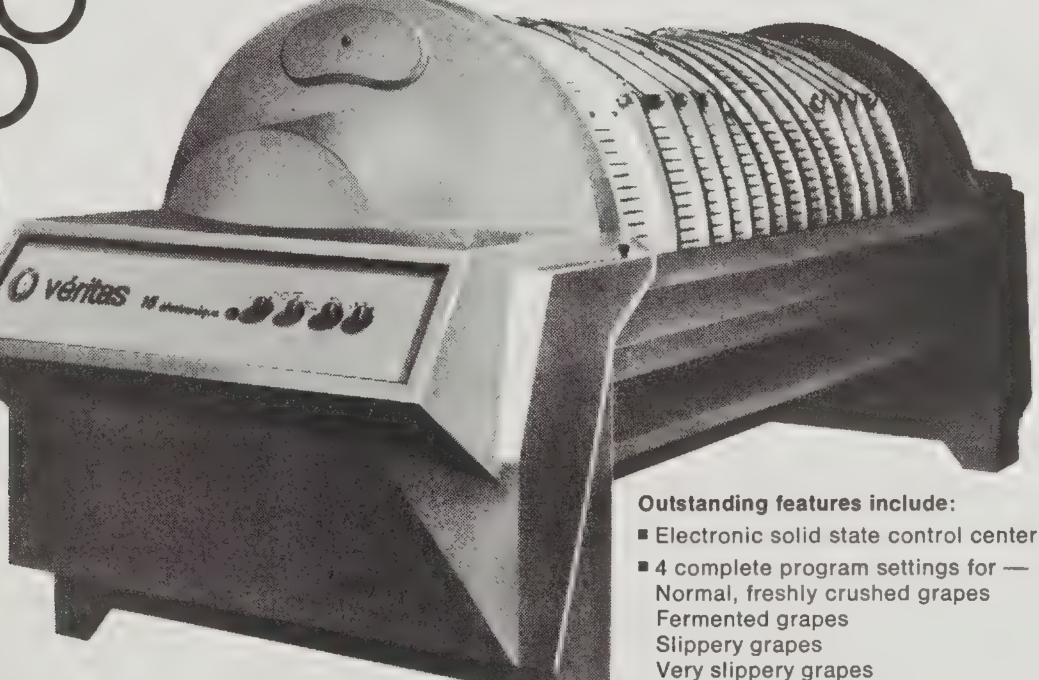

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BARREL BROKER UPDATE

BARREL BUILDERS

The cooperage of Tonnellerie Moderne of Brive, France, is now available from Barrel Builders for the first time in the United States. Tonnellerie Moderne has been manufacturing barrels for the French wine industry since 1930.

Oak for the barrels is selected from the Limousin and Nevers forests in France by the owner, Robert Treuil. After being split into stave blanks, it is then dried for two years before being assembled into barrels. Barrels are finished with heavy-duty galvanized hoops and tested.

The 225 liter barrel is available in the Bordeaux style, 95 cm long; and the Burgundy style, 90 cm long. Barrels have a one year guarantee backed by Barrel Builders. Current availability and prices are available from the St. Helena office, (707) 963-7914, or fill in PW reader response card.

Barrel Builders has also added stainless steel drums to their accessory list which includes bungs, bung coatings, barrel chocks, hoop drivers, and small barrels. Also available are: French and American oak tanks and puncheons, redwood fermentors, and Yugoslavian oak barrels.

BARREL COOPER ADDITION

TONNELLERIE MERCIER

The Cooperage of Tonnellerie Mercier, located in the Cognac area in France, is now available to wineries in the United States. Francoise Chauvin, export manager visits wineries to accept orders.

Available are Nevers and Limousin oaks, which are hand-split and air-seasoned for a minimum of three years. Light, medium or heavy toasting can be ordered.

225 liter barrels and 500 liter puncheons with eight galvanized hoops are made in the standard Bordeaux style. Staves are 27-29 mm thick. Upright tanks, round and oval casks, made from quarter-sawn wood, air-dried for five to seven years are also available.

Chauvin quoted prices in September, 1982 of 1550 francs for 225 liter barrels and 2730 francs for puncheons, all CIF Oakland. All equipment carries a one year guarantee for repairs and service. Chauvin can be reached at Tonnellerie Mercier, B.P. 16300, Barbezieux, France.

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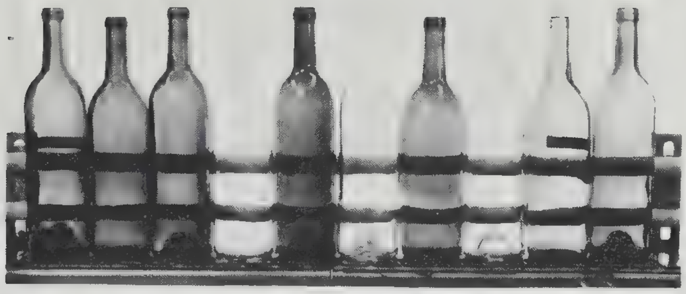
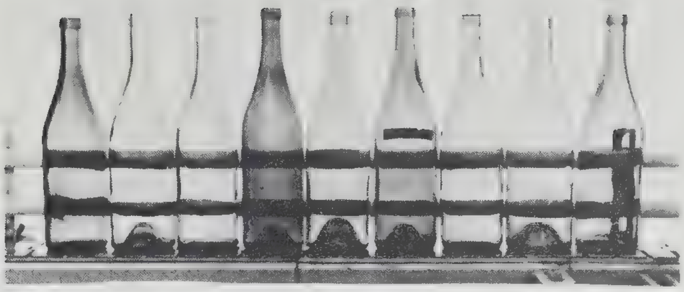
BOTTLE BUYING GUIDE

BOTTLE Size/Style/Color		VENDORS								
		Barrel Builders	California Glass	Calpac Container	Demptos Cooperage	Encore	Glass Container	Riekes Container	Seattle Recycling	Tonnellerie Francaise
187 ML										
Bordeaux	Champagne Green	X								
Champagne	Champagne Green		X	X			X			
	Emerald Green		X							
Hock	Champagne Green						X			
	Emerald Green						X			
375 ML										
Burgundy	Antique				X					
	Champagne Green				X	X				
	Dead Leaf Green				X					
	Emerald Green					X				
Pushup	Dead Leaf Green		X							
Bordeaux	Antique				X					
	Champagne Green	X			X					
	Flint				X					
Pushup	Champagne Green		X							
Champagne	Champagne Green		X							
Composite	Champagne Green		X				X			
	Emerald Green		X				X	X		
	Flint						X	X		
Hock	Amber							X		
	Flint							X		
750 ML										
Burgundy	Antique		X		X					
	Champagne Green		X	X	X	X	X	X	X	
	Dead Leaf Green	X			X	X				X
	Emerald Green		X	X		X	X	X		
	Flint		X	X		X	X	X	X	
	Georgia Green						X			
Pushup	Champagne Green		X					X		
	Dead Leaf Green		X	X						
	Smokey Quartz		X							
Bordeaux	Antique		X		X					
	Champagne Green	X	X	X	X	X	X	X	X	
	Emerald Green		X	X		X		X		
	Flint		X	X	X	X		X	X	
Pushup	Champagne		X	X		X		X		
	Emerald Green					X				
	Flint		X			X		X		
Pushup Taper	Champagne Green		X							
Champagne	Champagne Green		X					X		
	Flint		X					X		
Pushup	Champagne Green				X			X		
	Dead Leaf Green				X					
	Flint				X			X		
California Hock	Amber					X				
	Champagne Green					X		X		
	Emerald Green					X		X		
Hock	Amber		X	X		X		X	X	
	Champagne Green		X	X		X	X	X	X	
	Emerald Green		X	X		X	X	X		
	Flint		X	X		X	X	X	X	
	Georgia Green						X			

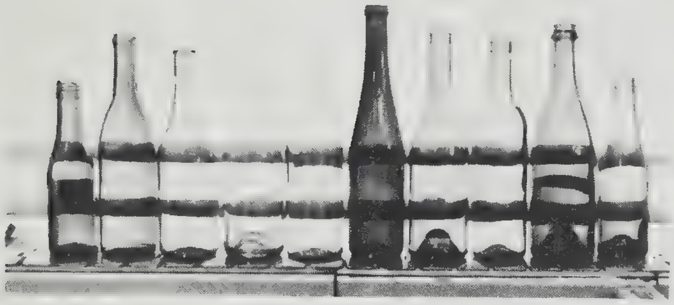
BOTTLE Size/Style/Color		VENDORS								
		Barrel Builders	California Glass	Calpac Container	Demptos Cooperage	Encore	Glass Container	Riekes Container	Seattle Recycling	Tonnellerie Francaise
1.5 Liter										
Burgundy	Antique		X		X					
	Champagne Green		X	X	X		X	X		
	Dead Leaf Green	X	X		X					X
	Emerald Green		X	X			X	X		
	Flint						X	X		
	Georgia Green						X			
Bordeaux	Antique		X		X					
	Champagne Green	X	X		X		X			X
	Emerald Green		X				X			
	Flint				X		X			X
	Georgia Green						X			
Pushup	Champagne Green						X			
	Emerald Green						X			
	Flint						X			
	Georgia Green						X			
Pushup Taper	Champagne Green		X							
Champagne	Champagne Green			X						
Pushup	Champagne Green		X	X	X					
	Dead Leaf Green				X					
	Flint				X					
Composite	Champagne Green		X	X		X	X	X		
	Flint		X				X	X		
	Emerald Green		X	X		X	X	X		
	Georgia Green						X			
Classic Jug	Champagne Green					X				
	Emerald Green					X				
Handless Jug	Champagne Green		X	X		X				
	Emerald Green		X	X		X				
3 Liter										
Burgundy	Champagne Green	X								
Bordeaux	Antique				X					
	Champagne Green		X		X					X
	Flint				X					
Champagne	Champagne Green		X		X					X
	Dead Leaf Green				X					
Classic Jug	Champagne Green		X			X				
	Emerald Green			X		X	X			
4 Liter										
Classic Jug	Champagne Green		X			X	X			
	Emerald Green			X		X	X			
	Flint						X			
	Georgia Green						X			
5 Liter										
Burgundy	Champagne Green	X								
Bordeaux	Antique				X					
	Champagne Green		X		X					X
6 Liter										
Burgundy	Champagne Green	X								
Bordeaux	Antique				X					
	Champagne Green		X		X					X
Champagne	Champagne Green		X		X					X
9 Liter										
Burgundy	Champagne Green	X								
Champagne	Champagne Green		X		X					



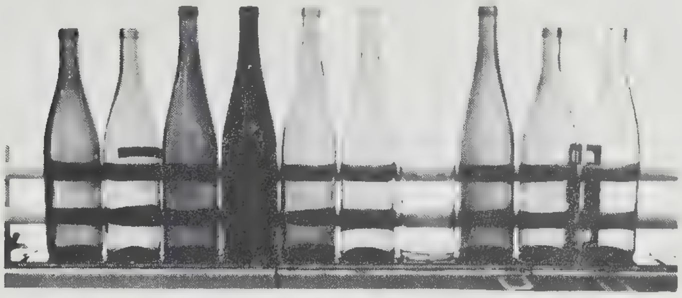
750 ML Bordeaux



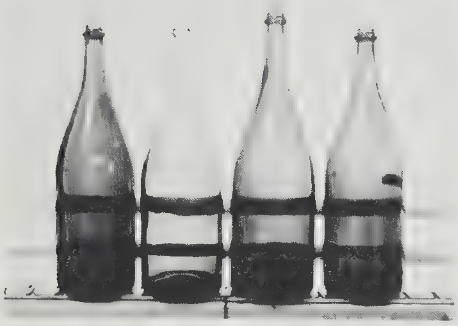
750 ML Burgundy



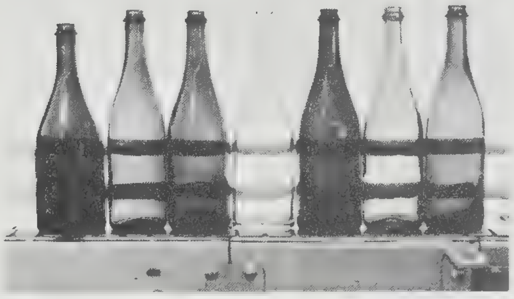
187 ML and 375 ML



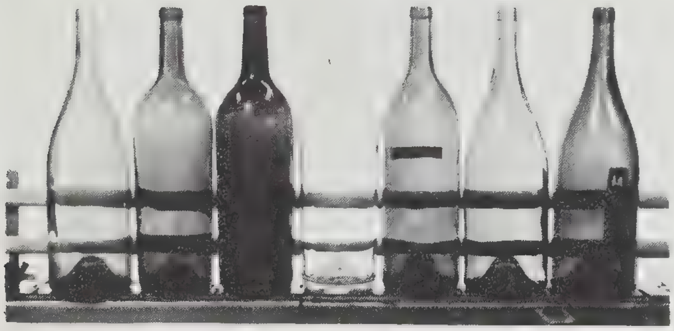
750 ML Hock and California Hock



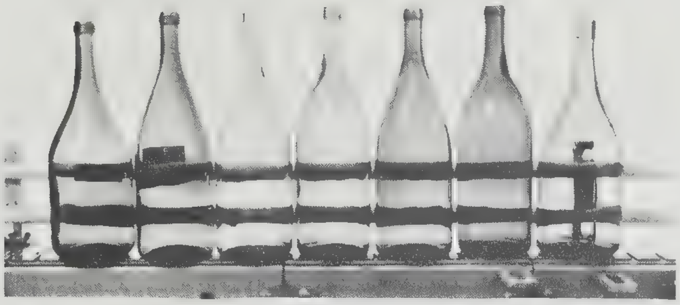
1.5 Liter Champagne



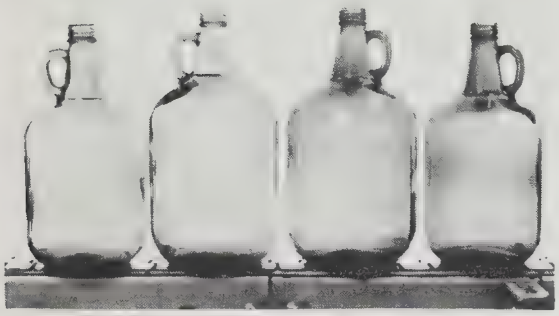
750 ML Champagne



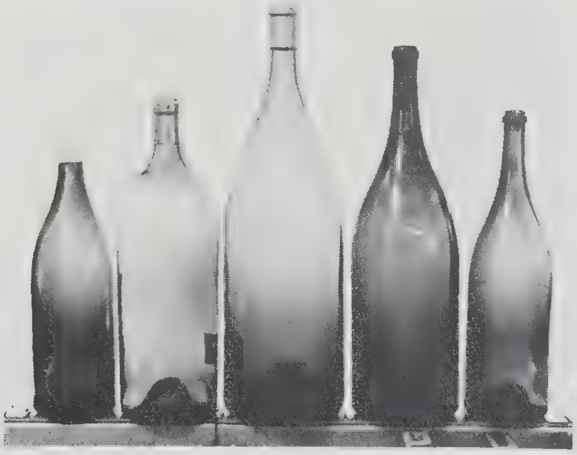
1.5 Liter



1.5 Liter



3 Liter and 4 Liter Jugs



5, 6, and 9 Liter

Bottle Samples for photographs supplied by California Glass, Calpac Container, Demptos Cooperage, Glass Container, and Riekes Container.

**PUZZLING OVER WHERE
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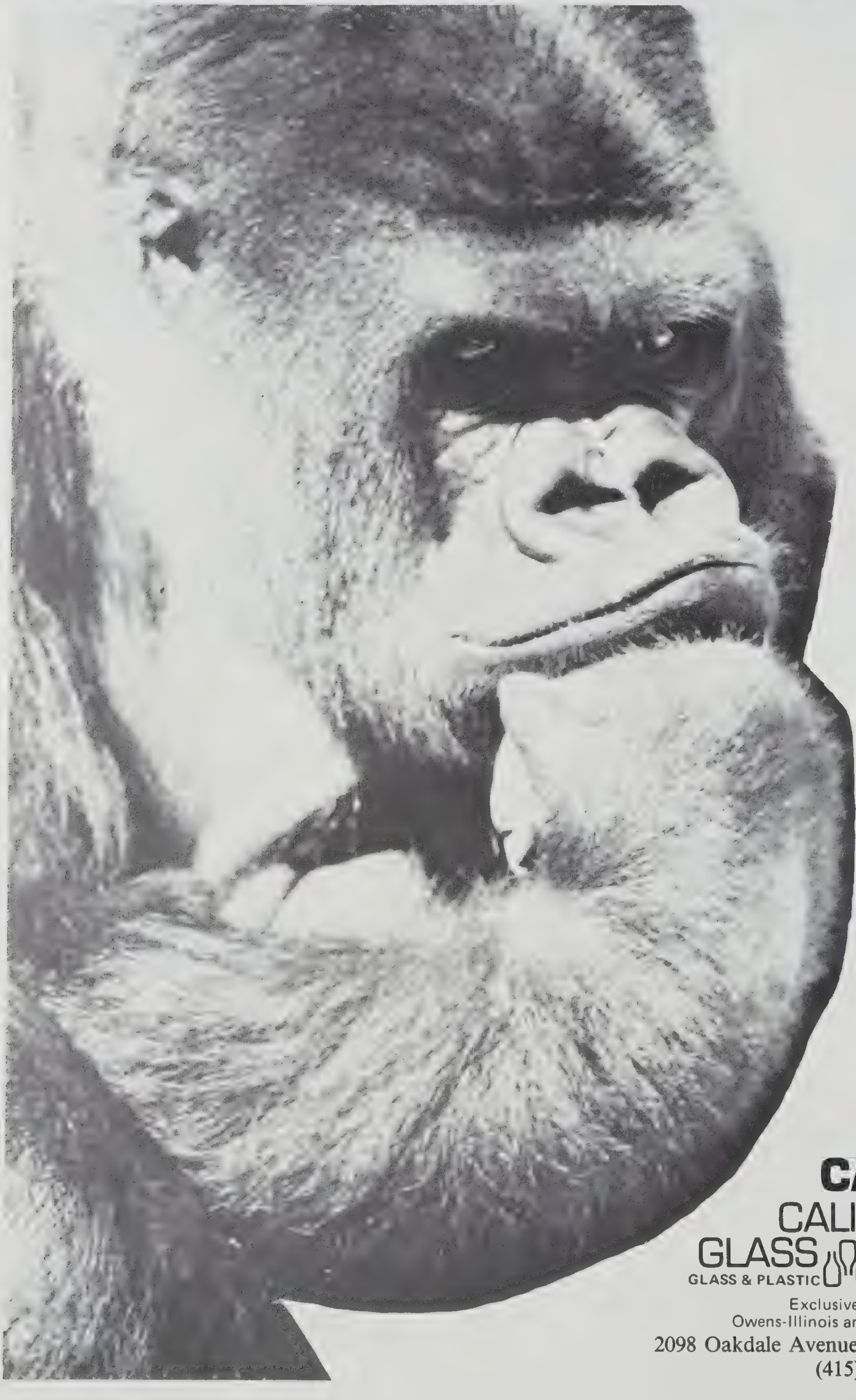

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Bottle Manufacturers Strive For Consistent Quality

Robert Fithian leaned forward in his chair and said, "If there's one thing that 16 years in this business has taught me, it's that making glass is an art!"

Roger Levkulics and Dennis Reeder nodded in agreement. The three men sat in Levkulics' office at Glass Containers Corp. in Hayward, CA, discussing the complexities of making a wine bottle.

Fithian is Glass Containers' wine industry marketing manager for the Pacific Central Region that includes California's Napa Valley. Levkulics is manager of the company's Hayward plant and Reeder is the plant's quality control supervisor.

The Hayward facility is one of ten plants operated nationwide by Glass Containers Corp. and the only plant to be devoted almost solely to the making of wine bottles.

Ninety-eight percent of the plant's production is dedicated to the wine industry, according to Levkulics. The Hayward facility produces about 1,250,000 cases per month, of which, 75% is in cork finished bottles.

Wine bottles, in general, are made from three major constituents—sand, soda ash and limestone. To these elements are added 15 to 30% cullet (recycled glass) and 1% of such minor ingredients as cobalt, magnesium and iron, Reeder said.

This mixture or batch is liquified in a furnace where temperatures range from 2700 to 2800 degrees Fahrenheit.

After completing this process, the molten glass is drawn off into individual molds. The precise amount of glass needed is cut off by mechanical shears.

After the bottle is formed by air pressure and has cooled to approximately 800 degrees, the first of three coatings is applied to the bottle surface.

The first coating is tin tetrachloride anhydrous, which is applied in a vapor form to add strength to the bottle.

The second application, referred to as a cold end coating, is an animal based product called AP5 developed by Ball Brothers.

The final coating, applied when the bottle has cooled to approximately 265 to 300 degrees, is called duracoat and is a polyethelene based material.

The coatings, Levkulics said, are used for three reasons: to protect the surface from scratching, to give lubricity (smoothness) and to provide protection in bottle to bottle contact.

These three points are crucial, he says, because of the increasing speeds of winery bottling lines.

Although some winemakers have objections to coatings because they make it more difficult for labels to adhere to the bottle surface, Levkulics says that his company has not had this problem.

"I think most winemakers agree with the desirability of the coatings and have solved the problem by trying different types of glue that will adhere to bottle surfaces with coatings," he said.

Quality control is crucial, Levkulics continued. "You're dealing with a semi-liquid substance and a high-speed process."

"We've tightened our quality control by computerizing several aspects of plant variables," Reeder added.

"Our furnace is under computer control and so is the Lehr which aids in the tempering of the glass."

In addition, the raw materials are mixed by computer at the Hayward plant and the scale for weighing the bottles and checking for capacity are also under computerization.

With so many variables, we asked Reeder, can inaccuracies occur—such as in the interior size of a bottle neck so that the cork is unable to create a perfect seal?

"We understand how critical corkage is and we are constantly monitoring it so that it meets the specifications," he answered.

It is possible that "some shrinkage" can occur when the bottle is cooling," he added. "A lot depends on the raw materials—it (shrinkage) is different for different types of glass."

In addition to visual inspection, electronic surveillance of the bottles is made to insure that each is perfect and contains no flaws.

Each bottle is also tested for breakage tolerance. "We actually try to break our bottles before sending them out," Fithian interjected.

In the last three years, Glass Containers Corp. has joined the campaign to "light weight" bottles.

"We are actually taking glass out of the bottles," Fithian commented. "What you get is a bottle lighter in weight but also one that hasn't compromised safety or strength specifications."

According to Fithian this has been accomplished by redesigning selected (not all) bottle styles.

"The industry seems pleased with the experiment because we have been able to maintain the same cost per bottle despite rising costs for freight and energy," he concluded.

Editor's Note: Several glass manufacturer representatives concur with the comments above and wish to emphasize the constant challenge to maintain quality while attempting to hold cost increases at a minimum as technology increases the speed of glass manufacture. ■

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Sterilized, Used Bottles Are Supplied to Many California Wineries

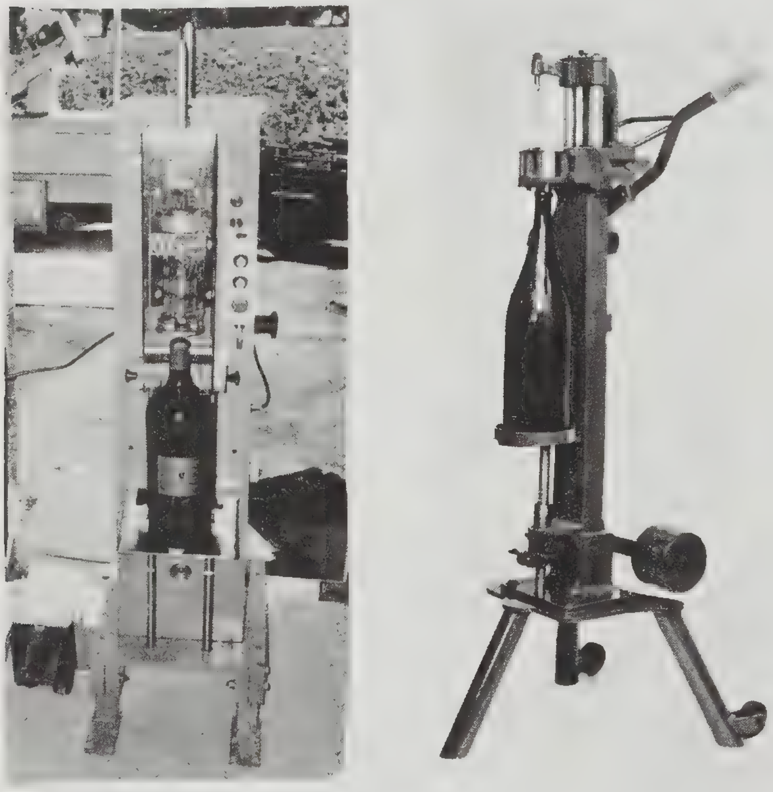
For nearly 50 years Frank Cadenasso, owner of Cadenasso Winery in Fairfield, CA, has been using recycled glass to bottle his wine.

"We've been re-using glass since Repeal in 1934," says Cadenasso, whose father started the winery in 1906 with $8.

"It saves my customers money. We buy used glass for 45 cents as compared with 85 cents for new . . . so we can pass the difference on to our customers."

A strong advocate of recycling, Cadenasso believes that the 75% of his 225,000 gallon a year production that is bottled in used glass cuts down on waste and helps keep the countryside clean.

Winemaker Greg Boeger agrees. "I like the idea of recycling plus it probably costs us $1 less per case for used glass," he says.



CORKER AND SPINNER for large size bottles are available for rental from California Glass Co. The Swiss-made Friedreich evacuating corker, built especially for the San Francisco-based supplier, can be used on three to nine liter bottles. A vacuum pump draws out all the air in the bottle head space to prevent oxidation of the wine. The Ottosick spinner handles one and a half to nine liter bottles. Foils to fit the large size bottles are available from California Glass Co. The company also has styrofoam UPS wine shippers available for 750 ml burgundy and bordeaux bottles in one, two, three, six and 12 pack configurations.

Ninety-eight percent of the seven to eight premium wines Boeger makes at his Placerville, CA winery are bottled in used glass.

Cost is also one of the reasons Harry Parducci, owner of Valley of the Moon in Glen Ellen, CA, favors using recycled bottles.

The price of recycled amber glass is $3.73 per case as opposed to $5 per case for new amber, he says.

At the 180,000 case Foppiano Wine Co. in Healdsburg, CA, owner Lou Foppiano has used recycled glass for the past three years for half of the wine he bottles in the four liter size.

Foppiano says that neither cleanliness nor breakage has been a problem with the used glass. Besides that, he says, he likes the idea of conserving the environment by using glass containers.

Concern for the environment, as well as cost, is why Thomas Kruse of Thomas Kruse Winery in Gilroy, CA, is a recycler.

"We're too wasteful in the United States, he contends. "We have five percent of the world's population but we use one-third of its resources."

While the trend toward recycling seems to be on the increase, the ability to meet the demand is not.

According to Peter Heylin of Environmental Container Reuse (ENCORE) in Emeryville, CA, they can't keep up with the demand for used glass. Currently, ENCORE processes just under a half million cases annually and regularly serves over 200 California wineries.

A case in point comes from Alexander Valley Vineyards in Healdsburg, CA, where in 1977-78 the winery used recycled bottles for 70% of their wines.

Today, says winemaker Dennis Hill, they use 15% and only for their secondary label and for bottling wines for other wineries.

Alexander Valley discontinued the use of used glass primarily because their supplier couldn't get them enough bottles for their increasing production.

Interestingly, Heylin points out that one of the reasons for the limited supply is the decline in the return of 750ml bottles. Since January, particularly in the San Francisco Bay area, there has been an absolute reversal in the relative amount of wine sold in 750 vs 1.5L and larger sizes.

He says that since 1976 the percentage of returns ran 70% for 750ml and 30% for the larger sizes. Since February the reverse has been true.

Heylin sees the economy as one of the reasons for the new trend. "The consumer seems to be buying more jug wine for use at home and to be choosing the house label when they dine out."

ENCORE, which began as an outgrowth of the Berkeley (CA) Ecology Center in 1975, buys and sells 375 and 750ml cork finished bottles as well as 1.5L in both cork and screw cap and the 3 and 4L standard jugs in screw caps.

While ENCORE is one of the major suppliers of used glass on the West Coast, many wineries have their own recycling programs.

At Valley of the Moon, for instance, every week the winery picks up between 150 and 200 cases of their bottles from restaurants that they service. Another 20% of their recycled bottles come from customers who return them.

"This operation works out very well for us," says Parducci. Like Cadenasso, Parducci says they have used recycled glass for many years. "In fact since 1943, when my father and his partner started the winery under the T and D label."

Kruse has been using recycled glass for six years at his 4000-case Gilroy winery.

His approach is to put an invitation on the back of his labels asking consumers to return their bottles.

Kruse, who makes six premium varietals, says, "People bring me all kinds of glass. The glass that I can't use, I give to a local recycler."

Once the winery has collected its recycled glass many make use of bottle washing and sterilizing facilities such as ENCORE, Sanitary Bottle in Los Angeles or the Washing Works at Seattle Recycling Inc., in Washington.

None of the winemakers interviewed had any complaints about the cleanliness of the recycled glass they were using. In fact, Parducci felt recycled glass was cleaner than new.

Boeger also agreed. "Actually the bottles are more sterile after the washing and heating process they go through. I know ENCORE has done swab tests and found there to be less dust than in new bottles."

The problems that seem to come up, instead, were those of color and size.

"Sometimes bottles aren't properly sorted according to size, says Mark Theis, winemaker at Monterey Peninsula Winery in Monterey, CA.

Both Louise Tomison of Delicato Vineyards and Foppiano said that sizing sometimes caused problems for them.

Tomison, who oversees bottling for the 500,000 case Manteca winery, said that they used only about 1% of used glass now.

"Recycled glass was okay when we were running a slow line and uncased the bottles by hand but not now when they are dumped automatically.

"I'm all in favor of using recycled glass but I can't sacrifice line time just to say I use recycled glass."

Foppiano says one of the disadvantages of resterilized glass is the difference in bottle heights and shapes.

"You don't always get one size all the way through. It would be a lot easier if glass manufacturers all made the same size.

"Just the other day we had a problem on the bottling line because of size difference. Our new pilfer-capper doesn't have a large tolerance. If we get a bottle that is one quarter of an inch off, it might not seem like a lot but it is enough to cause problems."

Heylin says that ENCORE deals only with standard sizes and shapes and regularly both lab and field-test bottles that they sell.

"We're very careful about quality. Most of our problems occur on the outside of the bottle—mainly with labels and color sorting," says Richard Evans, ENCORE's quality control supervisor. ■

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Buyer's Guide to **FINING AGENTS**

"Fining can be defined as the addition of a material to remove an undesirable constituent from the wine, while clarification is any action to assist in making wine clear," says Robert Scott of Scott Laboratories.

"Fining will do a lot to improve palatibility of a wine without taking away any real character of the wine," adds Julius Fessler. "Picking the right fining agents is the real art of winemaking. Chemistry of wine and the palate are very important in the use of fining agents."

Amerine quoted Negre from 1939, "Fining gives a more permanent clarification than filtering."

Scott adds that any clarification which can be accomplished by fining in a tank is much cheaper than by filtration and that while clarification is only one of the fining functions, it is a most important one.

Turbidity in a wine may be due to the presence of particulate matter in the form of grape tissue, yeast and bacteria, colloidally-suspended particles derived from the grape, or from changes occurring during ageing and storage. These may be in the form of proteins, pectins and gums, metallocolloids, or degradation products of polyphenols, suggests Scott.

"Fining agents clarify by one or more of three methods: adsorbtion, protein-tannin aggregation or electrostatic neutralization. Each of these actions, in its own way combines the very small particles into particles of sufficient mass/surface ratio so that they literally rain out from the wine or juice," adds Scott.

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Following are listed the fining agents, the chemical principle involved in the working of the agent, what it takes out and how it attracts it, and a buyer's guide to sources of the materials. A second question of: how to mix them up, how to add them, and how to remove them from the wine will be provided by Bruce Rector of the Napa Valley School of Cellaring in the next issue of Practical Winery.

Bentonite

A montmorillonite clay which exists as a complex hydrated aluminum silicate with exchangeable cationic components. When wetted, bentonite swells to many times its dehydrated dimensions with its subsequent activity in suspension being much like that of a multi-plateleted, long-chained, linear negatively-charged molecule (Singleton, 1969). Bentonite achieves removal of heat-sensitive proteins by adsorptive interaction between positively-charged proteins and the negatively-charged silicate.

Bentonite may indirectly adsorb a small amount of tannin via binding with proteins that have complexed with phenolics. In addition, bentonite is active in removal of enzymes, such as polyphenol oxidase, which may catalyze oxidation of phenolic substrates thus causing browning (Tabunkov, 1966).

Bentonite is known to affect red wine color directly by binding with positively-charged anthocyanins resulting in up to 15% removal (Knoll, 1963). For best flocculation in a wine needing ion-exchange, bentonite addition should preceed ion-exchange.

The minimum amount of bentonite necessary to achieve heat stability should be used, never more, as the same adsorbtive capabilities which remove protein and color, also adsorb flavor and aroma. Excessive bentonite will leave a dank aroma or earthy or dusty character to red wine.

Carbon

Decolorizing carbon is a phosphoric acid activated carbon, in powdered form, with a highly developed transitional pore structure and a large amount of macro pores resulting in a high rate of diffusion. The carbon has excellent filtration characteristics and a low content of extractable mineral impurities, such as calcium, iron, zinc and heavy metals.

The pore structure will adsorb organic compounds belonging amongst others to the tannin, carotenoids, chlorophyll (yellow color) and anthocyanidins (red color). The macro pore material is used to remove color, possibly undesirable brown coloration from white wines.

Deodorizing carbon is a steam activated carbon with mainly micro pores which will remove off-flavor components (volatile organic compounds) such as volatile acids (acetic acid), higher alcohols (fusel oils), and organic esters.

Activated carbons may induce oxidation of alcohol resulting in increased levels of acetaldehyde. Since carbon particles tend to remain suspended in solution, it may be necessary to follow carbon fining with a bentonite addition. Filtration is required in order to remove the ultrafine carbon particles remaining in suspension.

Casein

The principle protein in milk, casein occurs in solution as a positively charged macromolecule with a molecular weight of approximately 375,000. Casein is available in two forms: 1) purified milk casein soluble in alkali solution, and 2) potassium caseinate which is water soluble.

Casein may be used to remove "off" background flavors in taste (excess oak or phenolic bitterness), to improve the "nose," reduce color or slight browning. To prevent loss of body or fullness by the phenol adsorptive capacity, a tannic acid addition should be done first in a white wine. Emphasis is placed on the danger of excessive casein fining, which will strip the wine of its varietal character.

Gelatin

Gelatin occurs in solution as a positively-charged entity capable of reaction with negatively-charged species such as tannins and pigments. In terms of phenol adsorption capacity, gelatin preferentially binds with larger molecules having more phenolic groupings and more extensive hydrogen bonding (Singleton, 1967). Thereby, gelatin has a less dramatic effect of color reduction in younger wines than in older products.

As a generality, gelatin additions may result in color shifts in red wines from tawny (brown) to a more ruby red.

Gelatin is available in several forms and grades. Grade refers to purity and bloom refers to the gelatin's ability to absorb water. The higher the bloom rating, the greater absorption capability. Forms include leaf and granular.

As most white wines have a low precipitable phenol content, tannic acid additions may have to be made in conjunction with the gelatin fining. Overfining with gelatin may strip wine character and render the wine heat unstable. Counterfining with bentonite often follows gelatin.

In white wine, gelatin may often remain in suspension unless a silica gel product is added first, in place of tannic acid.

Isinglass

Produced from sturgeon collagen, this very expensive material is sometimes used on white wines, possibly sparkling wines to enhance clarification.

Kolor-Fine™

A modified potassium caseinate which can be used to improve settling and/or remove precursors and polyphenolics before or after browning has occurred.

PVPP

Polyclar® AT is polyvinylpolypyrrolidone, which has a high molecular weight, and is composed of cross-linked monomers of polyvinylpyrrolidone (PVP) which is available as a finely divided, dry white powder. The insoluble form of PVP is completely removed in the lees by settling and filtration, and can be added before, during, or after fermentation.

The polyamide-Polyclar AT is specific for small polyphenols, especially the catechins which are involved in browning and pinking reactions, while gelatin, casein and isinglass are effective on larger polyphenols. Polyclar AT is a registered trademark of GAF Corp., the exclusive manufacturer in the USA.

Sulfex™

An insoluble chemical in paste form which contains copper sulfate in a complex form to remove sulfide ions. A tight depth filtration is necessary to remove all the material.

Silica Gel-Baykisol 30, Kieselsol, Silica Sol

An aqueous milkly colloidal dispersion of silicic acid. The negatively charged solution promotes flocculation when collision occurs with positively charged gelatin. All yeast must be racked off or action can be inhibited.

A silica-gel product introduced ahead of gelatin to the wine, may reduce the total amount of gelatin required and avoid undesirable gelatin-protein cloudiness. Rapid sedimentation of suspended bentonites will also occur after introduction of the silica-gel.

Topping Agents—Klear-Mor™, Sparkolloid®

These topping agents are reportedly a mixture of polysaccharides in a diatomaceous earth carrier. At the pH of wine, the agents have a positive charge which neutralizes the repelling charge from many small particles allowing them to aggregate and form compact lees. They have no effect on the wine, except to improve clarity.

Trace Metal Removal—Cufex™, Metafine™

An insoluble chemical supplied in paste form to remove copper and iron which can cause clouding and sedimentation. A topping agent is recommended to follow the chemical to aid in settling.

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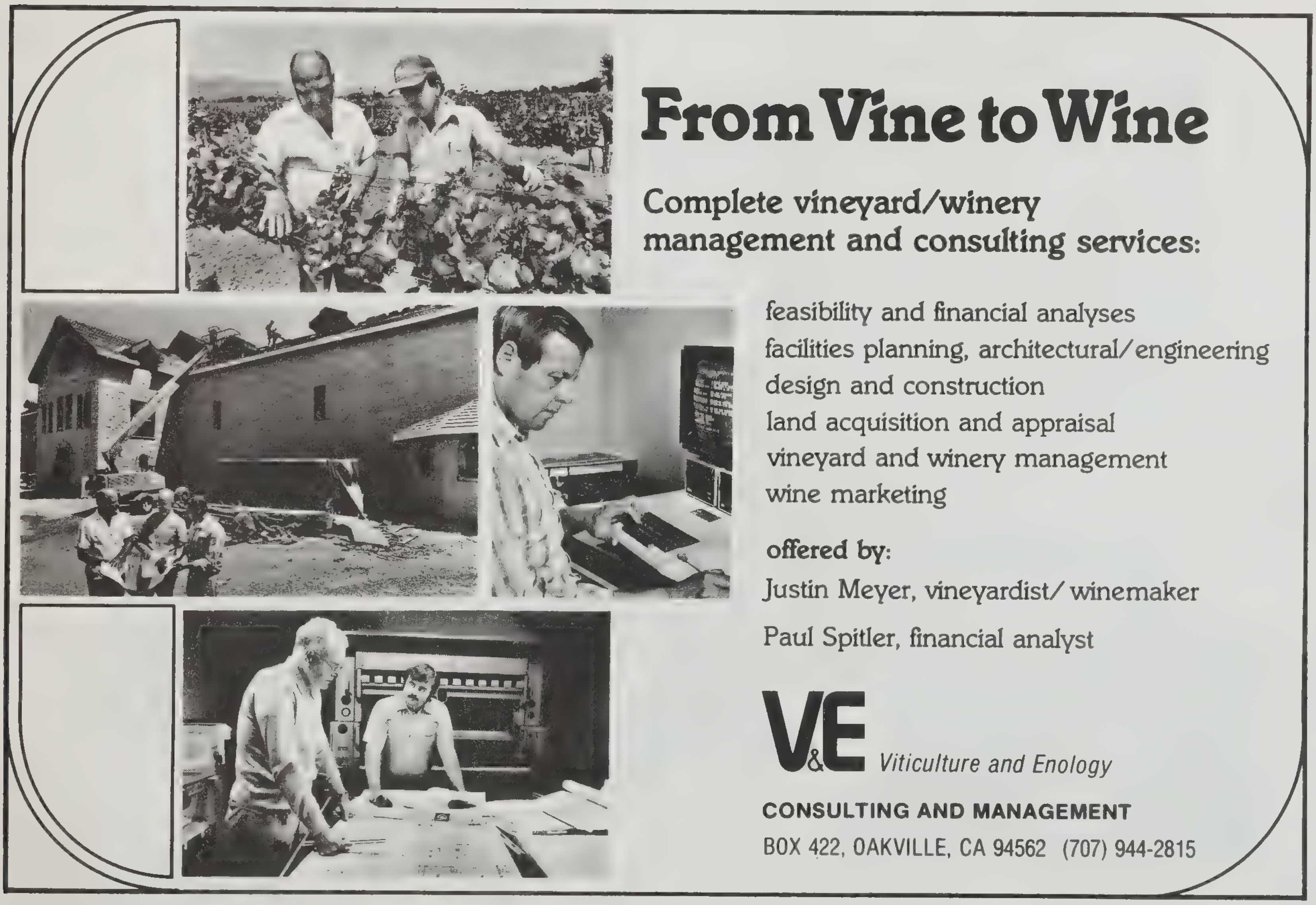
FINING AGENTS PURCHASING GUIDE

PRODUCT	VENDOR	PURCHASING QUANTITY
Bentonite	Bentley Chemical	100# bag
	Finer Filter Products	100# bag
	Great Fermentations	8 oz
	Great Western Chemical	100# bag (KWK)
	Wine & The People	8 oz
	Wine Lab	1 oz, 1#, 10#
Carbon		
deodor	Bentley Chemical	50# bag
	Finer Filter Products	50# bag
	Great Western Chemical	55# bag
	Wine Lab	1 oz, 1#, 10#, 50# bag
	Union City Chemical	55# bag
decolor	Bentley Chemical	40# bag
	Finer Filter Products	40# bag
	Great Western Chemical	40# bag
	Wine Lab	1 oz, 1#, 10#, 40# bag
	Union City Chemical	20 kg, Poly C(CA 3) 15 kg, CA 1
Casein		
	Bentley Chemical	25 kilo bag
	Finer Filter Products	50# bag (potassium caseinate)
Kolorfine	Finer Filter Products	50# drum, custom pack (modified casein)
	Scott Laboratories	70# bag
Gelatin		
	Bentley Chemical	100#, 300# 75 bloom, granular, grade A 100#, 300# 100 bloom, granular, grade A 300#, 100 bloom, granular, grade B
	Finer Filter Products	100#, custom pack, 75 bloom, granular grade B 100#, custom pack 100 bloom, granular
	Great Fermentations	1 oz, custom pack, 75 bloom, granular grade B
	Great Western Chemical	330# drum, 100 bloom, granular, grade A 1.1# leaf
	Scott Laboratories	100#, 75 bloom, granular
	Wine & The People	1 oz
	Wine Lab	1# leaf
Isinglass		
	Finer Filter Products	1#
	Great Fermentations	.18 oz
	Wine & The People	1 oz, 1#
	Wine Lab	custom pack

Silica Gel		
Baykisol 30	Finer Filter Products	130 kg drum, custom pack
Kieselsol	Wine Lab	custom pack
Silica Sol	Scott Laboratories	1 liter, 10 liter
PVPP		
PolyClar AT	Bentley Chemical	100# drum
	Finer Filter Products	100# drum, custom pack
	GAF Corp.	10#, 100# drum
	Great Fermentations	½ oz, 8 oz
	Great Western Chemical	100# drum
	Wine & The People	2 oz
	Wine Lab	50# bag
Topping Agents		
Klear-Mor™	Finer Filter Products	50# drum, custom pack
	Wine & The People	3 oz
Sparkolloid™	Great Fermentations	1 oz, custom pack
	Scott Laboratories	25#
Trace Metal Removal		
Cufex™	Finer Filter Products	10#, 50# pail
Metafine™	Scott Laboratories	20 kg pail
Sulfex™	Finer Filter Products	10#, 50# pail



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PINOT NOIR

By DON NEEL

Many Oregon winemakers feel that their climate is well-suited to production of high quality Pinot Noir grapes. Six winemakers have many similarities and differences amongst them. In addition, Associated Vintners in Seattle, WA has been buying grapes from well-suited vineyards in Yakima Valley, located in central Washington.

Oregon winemakers interviewed include Myron Redford, Amity; Joe Campbell, Elk Cove; Dave Lett, Eyrie; Dick Erath, Knudsen-Erath; Ron Vuylsteke, Oak-Knoll; and Dick Ponzi, Ponzi Vineyards. Associated winemaker is David Lake.

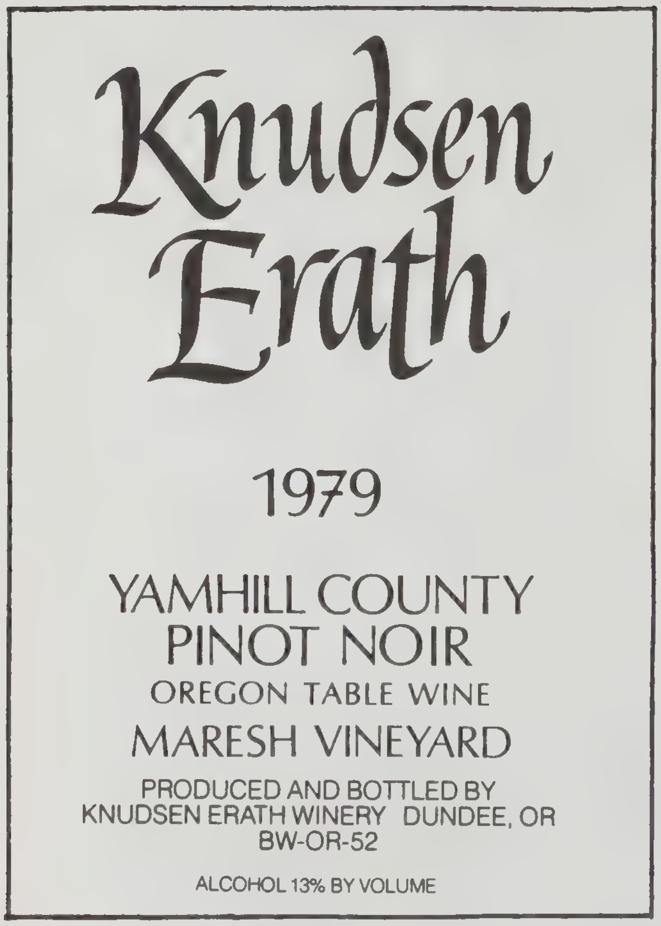
How do you describe your style of Pinot Noir?

"Pinot Noir is defined by the vineyard's micro-climate, soil, slope, elevation and to a lesser extent, how the winemaker handles it. We have a fresh fruity aroma in our young wine and bottle age marries wood and fruit into a very complex wine," says Dave Lett.

"Our wine is very delicate. The main difference between years is the size of berry and cropload – vintages with small berrys and smaller croploads make the most interesting wines," adds Lett.

"I want to make a burgundian style wine with good body and enough structure to hold the wine during ageing," says Myron Redford.

"We are able to achieve a little more color, a more substantial wine with more alcohol than the delicate Oregon Pinots. We must be very careful of choosing the appropriate micro-climate. We do have some cool areas which are appropriate for Pinot Noir," says David Lake.



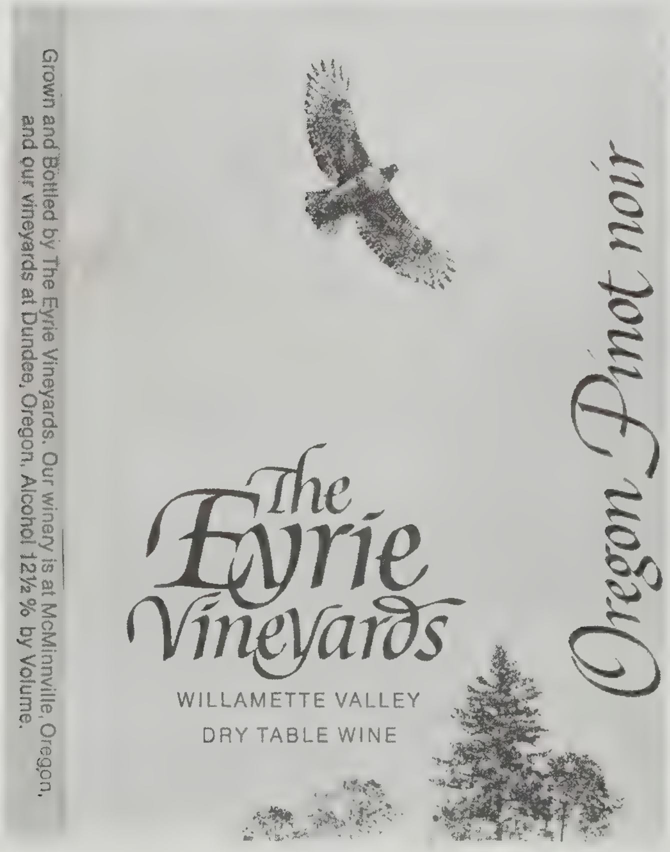
Knudsen Erath

1979

YAMHILL COUNTY
PINOT NOIR
OREGON TABLE WINE
MARESH VINEYARD

PRODUCED AND BOTTLED BY
KNUDSEN ERATH WINERY DUNDEE, OR
BW-OR-52

ALCOHOL 13% BY VOLUME

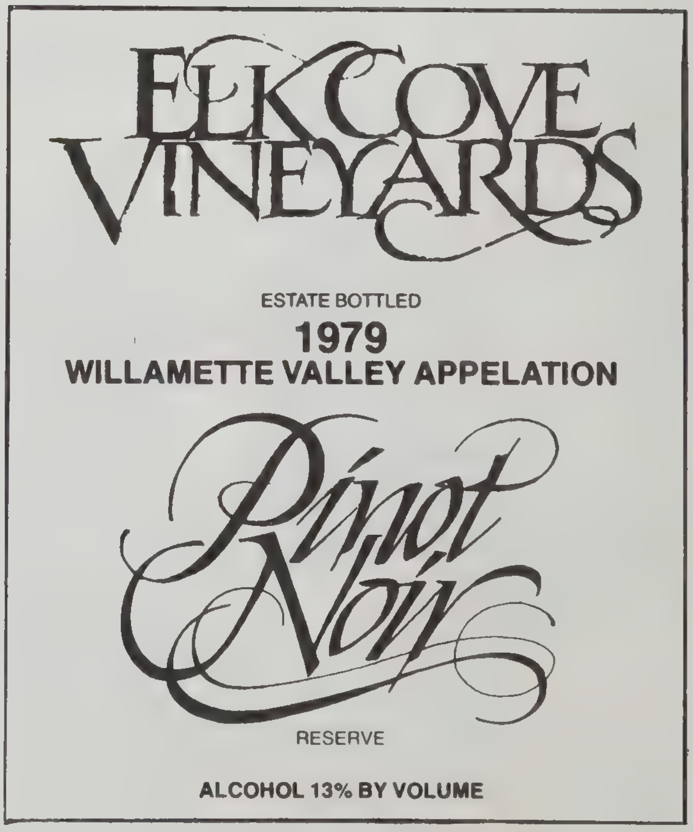


Grown and Bottled by The Eyrie Vineyards. Our winery is at McMinnville, Oregon, and our vineyards at Dundee, Oregon. Alcohol 12½ % by Volume.

Oregon Pinot noir

The Eyrie Vineyards

WILLAMETTE VALLEY
DRY TABLE WINE



ELK COVE
VINEYARDS

ESTATE BOTTLED
1979
WILLAMETTE VALLEY APPELATION

Pinot Noir

RESERVE

ALCOHOL 13% BY VOLUME

Seven Winemakers Explain Their Style

"We would like to make a relatively robust, intensely flavored burgundian style wine. Most crucial in a Pinot Noir is the aroma and bouquet; if it is in the nose, it will be in the glass. The most enjoyable Pinots are exceptional in the nose!" says Joe Campbell.

"Pinot Noir is not an aggressive grape. I want to bring out all of its character without losing the silky quality. It is a tough grape to describe. Pinot can seduce you with a meal; the first glass is ok, then the wine grows on you as it unfolds," says Dick Erath.

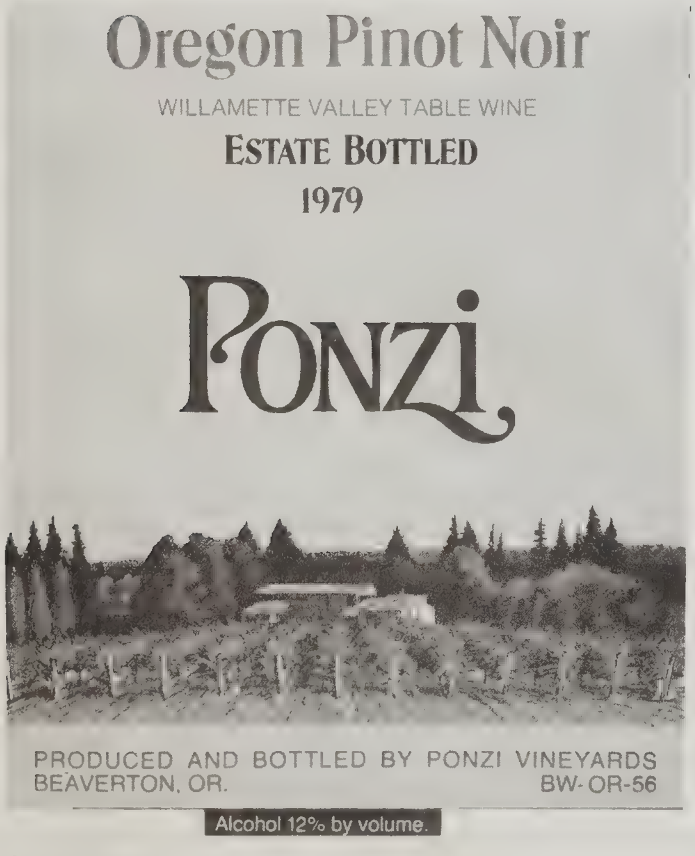
"Our Pinot Noir has a balance of oak and fruit with a long finish," says Ron Vuylsteke.

"Originally, I was looking for heavy color, a more robust wine. Now, I am most satisfied with lighter, more elegant wine. I don't worry about color or alcohol; I try to bring out the intensity of the true Pinot Noir flavor," says Dick Ponzi.

What are the unique characteristics of the winemaker's vineyards and how is the time of harvest determined?

Amity's estate vineyard of heavy clay loam soil at 600 feet elevation with a southwest exposure was 11 years old in '81. It is a moderately cool site, as breezes from the ocean, 45 miles west, funnel through the coastal range opposite Amity.

Redford also buys grapes from Sunnyside, a cooler hillside vineyard with old vines on a south-southwest exposure near Salem. More grapes come from the Redhills Vineyard near Roseburg, which has jory soil on a southern hillside. Another major vineyard is Woodland Hills Farm



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Oak Knoll
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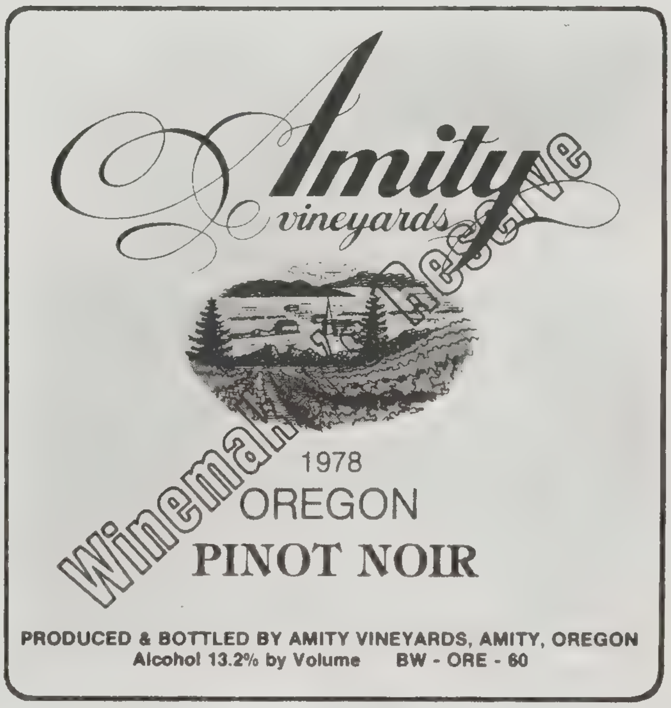
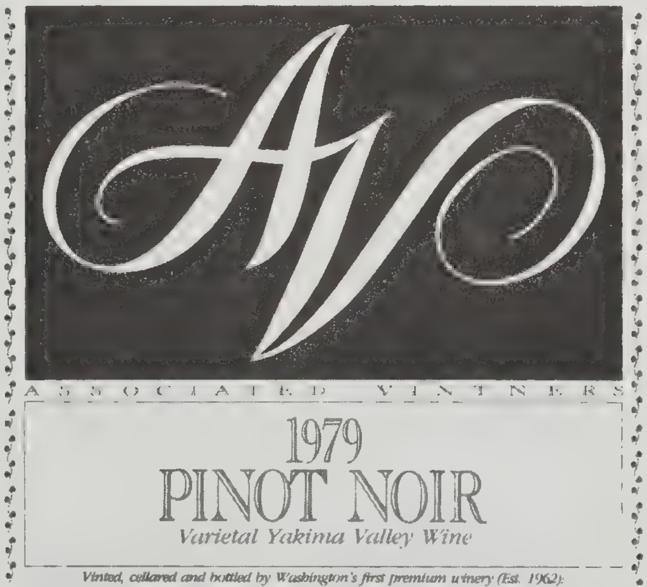
PRODUCED & BOTTLED BY OAK KNOLL WINERY, INC. HILLSBORO, OR
ALCOHOL 12% BY VOLUME




AV
ASSOCIATED VINTNERS
1979
PINOT NOIR
Varietal Yakima Valley Wine
Vinted, cellared and bottled by Washington's first premium winery (Est. 1962): Associated Vintners, Redmond, WA. Alcohol 12.5% by volume

in Yamhill, which is also planted on a southwestern slope.

Estate vines are vertical curtain and cane pruned. Redford is experimenting with heading the vine at five feet and letting the vine hang.

"Pinot Noir vines are lazy and supple, they want to lay on the ground," notes Redford. He wants yields under three tons/acre and usually gets between one and three tons/acre. Both the Wadenswill and Gamay Beaujolais clone are in production. Blocs of Pommard and Mirassou clones will bear in '82.

At harvest, Redford wants a pH of 3.3 or lower and the acid will be between 0.8-1.1, and sugar between 18-22.5° Brix. "I have found that Oregon fruit loses color as it ripens—high pH gives you low color," Redford points out.

The main threat to Pinot in Oregon is rain, according to Redford. "We can tolerate small rains only. If the grapes are nearly mature and the rains come, I will pick, if not mature, I will let the fruit hang."

A liquid sulphur is sprayed on the vines, every 10-14 days until the grapes begin to change color.

Ponzi's estate vineyard, on deep benchland, is between 200-250 feet elevation. Tualatin River, 1,000 yards south of the vineyard, provides both a stabilizing water mass and a cool air drainage basin. The three-acre Pinot planting, established in 1970, is divided between Pommard and Mirassou clones. Soil is sandy loam and vineyard rows run directly north and south.

Vines are trellised in a vertical curtain with spur-cane pruning. Ponzi summer prunes as well to maximize sun-leaf exposure. Pinot Noir is double-caned with four canes/vine to reduce vigor; production in '79 was four tons/acre. Two canes/vine will produce 2½ tons/acre.

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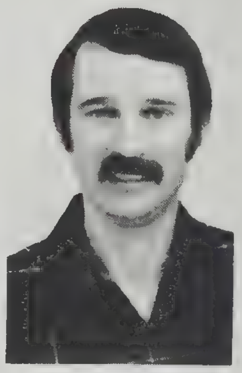
Additional grapes are purchased from the Medici Vineyard, ten miles southwest of the winery in Newberg, and Five Mountain Vineyard, eight miles east in Hillsboro.

The Pommard clone is planted at Medici on five acres of steeply sloping southern-exposure jory soil. Vines are trained in a vertical curtain with spur-cane pruning; production is 1½ tons/acre.

> *'Most crucial in a Pinot is the aroma and bouquet... The most enjoyable Pinots are exceptional in the nose!'*
>
> —Joe Campbell



At Five Mountain Vineyard, Pinot Noir is planted on five acres of sandy, clay loam on a south-east hillside. Vines are trained in a vertical curtain and spur-cane pruned with production at 1½ tons/acre. Five Mountain has a clonal test plot identical to one at Knudsen-Erath, which will bear fruit in '82.

While Oregon weather can be *THE* determining harvest criteria, Ponzi looks at sugar, acid and pH along with other factors. For example, in '79, he pulled basal leaves off the vines in the estate vineyard to expose the fruit and feels the effort helped maturity. Ponzi also notes when the basal leaf changes color along with character of the grape skin at harvest, in relation to where flavor comes from—layers below the skin.

Bird control is accomplished with ¾ inch conweb plastic netting applied to both sides of the row from fruit level to the ground. The practice was begun in '78, and has achieved great success, after exhausting many noise-making methods.

Ponzi has observed that netting, by totally eliminating birds pecking at the fruit, also eliminates the subsequent juice flow which promotes mold growth and attracts yellow jackets (in some years a considerable problem). Not only is there no crop loss but the clusters are in much better condition than prior to the use of netting.

In 1980, Ponzi picked between 22-23° Brix; in 1981, between 21°-22° Brix with acid about 0.9, pH at 3.0.

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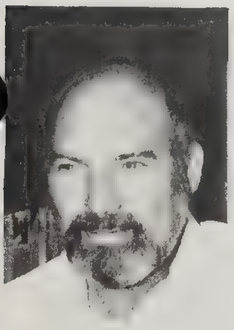
Erath uses two vineyards and has two production clones: FPMS-103, a heat-treated Pommard clone from Davis; and Davis 3A (Wente), non heat-treated. One vineyard planted in '69 has willakenzie soil (shale and sandstone) on a hillside. The second vineyard, planted in '72, has Jory (decayed basaltic soil) on a hillside.

Willakenzie soil is shallower, thinner and dryer; earlier maturity and riper grapes come from the southern exposed 350 foot elevation vineyard. Jory soil is monolithic and the eastern exposed slopes planted at 650 foot elevation deliver mature fruit a week later.

Due to excess nitrogen, potash is applied at 80 pounds/acre or more for the past three years. Erath notes during the growing season, a narrow temperature change between night and day, which he feels is better for Pinot Noir. Heat units vary between years from 1900-2600.

No sunburn problems have been experienced on the cane-pruned vines planted 6 x 9. Erath is experimenting with cordon pruning. Clusters are thinned to achieve about three-and-one-half to four tons/acre, depending on when bloom occurs. "We have a rough guideline of 100 days from the start of bloom to picking," says Erath. Vines are trimmed twice during the growing season.

Mildew is a constant problem requiring spray five or six times each year. Erath is trying to open up the vine and get more light and heat on the primordia buds of the next year's fruiting canes.



'As the vines get older, we get more tannin, more depth and complexity.'

—**Dick Erath**

A test block of 13 clones collected from Davis; L'Espiguette, France; Colmar, France; and Geisenheim, Germany is being nurtured by Erath and sponsored by the Table Wine Research Advisory Board of Oregon. The board collects $10/ton from wineries for research and a second plot is located at Five Mountain Vineyard. The vines, indexed for virus at Oregon State University, were planted on their own roots in '79.

Erath's actual harvest is determined by a pH goal of 3.1-3.2 where the level of malic acid may be double that of tartaric. Sugar will be between 20.5°-22.5° Brix, and acid between 1.0-0.85. "One or two inches of rain will not hurt Pinot, more would, but I would prefer to pick before the rains," says Erath. In low sugar years, the must is chapatalized.

Eyrie's vineyards are all planted on southern slopes between 250 and 450 feet elevation. Hillsides maximize sun exposure and hillside soil is lighter, less nutritious, has good drainage and air drainage for frost protection. Once every four years, 10-20 pounds/acre of nitrogen is added to the non-irrigated vineyards.

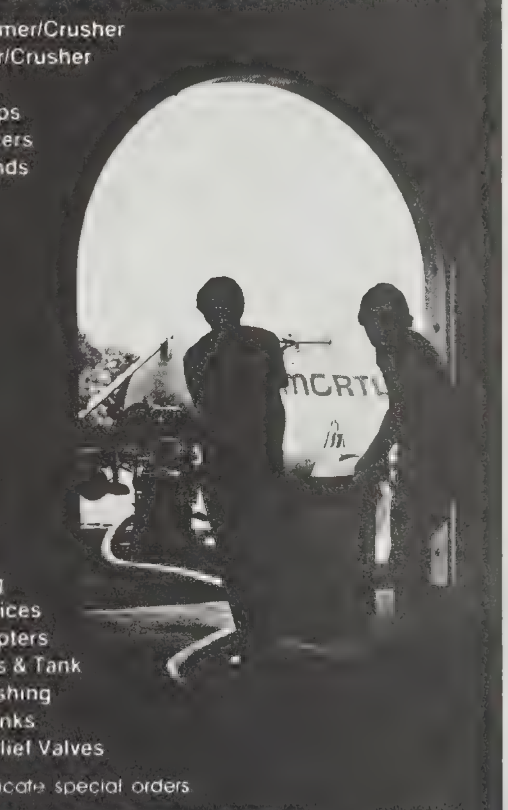
One vineyard bloc is jory-clay loam, another is Woodburn, a heavier soil. Lett has three clones; Pommard, Wadenswill from Switzerland, and a Gamay clone (called Pinot Noir by UC Davis) which ripens later and has higher acid. Cane-pruned vines are pruned to 24 buds and cordon pruning is being experimented with. Average yield is two tons/acre, two years in 12 saw four tons/acre and the low has been 0.8 tons/acre.

Lett notes that rain and cool weather can be a problem in June during the time of bloom. 'Maturity' is much more complex than the balling/acid ratio says Lett. "We certainly look at those two things but also monitor pH and we hope to have equipment to do quantitative malic analysis soon. These quantifiables are important but the subjective factors of look, taste and feel of the grapes is equally important in determining ultimate harvest date," adds Lett.

Eyrie's normal harvest occurs in the middle of October. Robins and Cedar-Waxwings seem to show up soon after significant fall rains but will appear eventually regardless of weather. Protection in the past has been with hawk kites and various noise devices with partial success. In '82, all vines will be netted. (In '81, the vineyard was crash picked to avoid a total wipe-out.)

Three vineyards produced grapes for **Elk Cove** in '81. The home vineyard of eight acres is in a bowl with eight to 16 inches of Willakenzie silty loam on top of a decayed basaltic underlayer between 550-700 feet in elevation and has a southern exposure. Single vertical-curtain, cane-pruned vines are planted 6 x 7, allowing 1054 vines/acre.

Desired production is 2.5-3 tons/acre and vines are pruned to two canes and two renewals, about 26-30 buds per vine.



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Since '79, grapes have come from the Wind Hill Vineyard near Banks. The southern sloped vineyard is between 600-800 feet in elevation and has a red shot soil. Wind Hill, a straight hillside, is warmer than the estate vineyard, receiving an extra hour of sun in the morning and an extra half-hour in the evening.

Wind Hill is the first vineyard to be harvested each year and will be 1-1½° Brix higher than the estate vineyard. Acid will be over 1.0, while pH can vary between 3.0-3.7. "The grapes are more tannic, more astringent, have more berry-like aroma," comments Campbell.

Dundee Hills Vineyard produced grapes for Elk Cove in '81. This vineyard also receives more sunlight hours and grapes mature seven-ten days ahead of the estate vineyard. The south facing vineyard between 450-800 feet in elevation has jory soil, a red clay-loam. "Dundee Hills gives us more intense grapes with bigger body in a cool growing season," notes Campbell.

"Estate grapes have more cherry-like aroma. We have added boron since '80 to the estate vineyard to improve berry set in two-one pound/acre applications of Solubor (20% actual boron). We spray for mildew, rotating chemicals each year to avoid building up resistances," adds Campbell.

At Elk Cove, six or seven sulphur sprays/year begin when there is eight to 12 inches of shoot growth on the vines, followed in two-three week intervals, finishing by mid-July. One Karathane spray is applied in the first or second week of August. Also, benalate in two pounds/acre and captan in four pounds/acre is sprayed at bloom to protect against bunch rot.

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The cool estate vineyard is picked about the middle of October, rarely before October 1 or after October 25. Campbell likes acid over 1.0 and has gotten 1.0-1.2. His target is 23-24° Brix, in a cool growing season—22-22.5°. "pH between 3.0 and 3.7 is acceptable, I have noticed that high pH in Pinot shifts the color to orange-brown from purple," says Campbell.

'American oak barrels do have strong flavor and must be watched closely; they do give me satisfactory oak flavor.'

—**David Lake**

Campbell monitors the condition of the grapes, not wanting anymore than 15-20% raisining. Rainfall makes grapes turgid, causing splitting, of which only a small amount can be tolerated. "Raisining occurs more often on younger vines due to hot days and cool nights late in the growing season," adds Campbell. Estate vines were seven and nine years old in '81.

In the '79 vintage at **Associated Vintners, (AV)** grapes came from three vineyards in Yakima Valley. Two vineyards were near Sunnyside; one vineyard that was planted there in '62, is still delivering grapes to AV. The third vineyard in Grandview was planted in 1974 and is still producing grapes for AV.

The two current producing vineyards are on hillsides with southwestern exposure in sandy loam soil on the surface with a Kalichi layer (lime) from 18 to 36 inches under the surface, which must be broken up before planting. The vineyards are between 800 and 1000 feet in elevation, away from the valley floor to avoid frost.

Vertical trellis vines with one catch-wire are planted 10 x 8 and bilateral cordon pruned. Vineyards receive between 2400-2600 degree days. Normal rainfall is eight-ten inches/year. About 21 inches of irrigation water is added each year to the vineyard by overhead sprinkler in one vineyard and by furrow in the other vineyard.

The last irrigation is done about Aug. 1, the vines are stressed through harvest, and then one irrigation is done after harvest to wet the soil, to be an insulator against frost, before the irrigation canals are closed Oct. 31.

AV vineyards control powdery mildew with systemic bayleton from airblast spray which is more effective than sulfur dusting in the past years. Application is at least twice, at bloom and two or three weeks afterward.

To reach an ideal cropload of three tons/acre, the vines are pruned to 40-45 buds. The vines delivered three and one-half tons/acre in '81, a little high according to Lake, while winter cold in '79 resulted in a lot of bud kill and a yield of one and one-half tons/acre.

Lake's harvest criteria is a balance of sugar, acid and pH: 22-23° Brix, acid has ranged from 0.8-0.96 with an average of 0.9, and pH between 3.2-3.4. Typical harvest is early October, '79 was late September, '81 was late October.

Oak Knoll has purchased grapes from the Dion Vineyard, which has sandy, clay loam soil on a south-southwest slope planted with the Gamay and Pommard clones, between 300 and 400 feet elevation.

Grapes have also come from the Shafer Vineyard which has Willamette jory soil—sandy, clay loam. Pommard clone vines are planted on a southwest hillside between 600 and 700 feet elevation.

Vertical curtain vines are caned and spurred with six wires, top of the vines is seven feet and there are two side wires. Depending on the year, yields have been five and one-half to six tons/acre.

First harvest criteria is acid between 0.95-1.0 and sugar about 21° Brix. Second harvest criteria is the goal of full, dark color in the grape, right up to the stem.

How is the fruit crushed and how is fermentation conducted?

Grapes arrive at **Elk Cove** about 48°-50° F and are all crushed with 50 ppm SO_2 into four by four foot 200 gallon bins. Assmanshausen yeast has been used for five vintages which gives an extended fermentation. Punching down, two or three times/day begins 24-48 hours after inoculation and continues for 10 to 14 days.

> *'For a red wine to age, you need tannin or acid, we have good natural acidity, therefore no need for stems.'*
>
> —David Lett

After the wine has achieved dryness, skin contact continues in order to gain more color during three or four extra days. Campbell is experimenting with stems during fermentation. He began experimentation in '79 and has varied amounts by vineyard and vintage. Most vintages have 75-100% stems to add some tannin for complexity and ageing.

Campbell plans to stay with bin fermentation, which he feels gives him better fermentation control to make better wines.

All grapes are crushed at **Eyrie** with 70 ppm SO_2, to restrain wild yeast, into 1200 pound fermenters. Grapes come in about 55°F and are inoculated with Champagne yeast.

Fermentation takes off in three or four days and punching-down is done every two hours during the most tumultuous fermentation lasting about two days. Zero balling is achieved about one week to ten days after inoculation.

Lett has an 'infravin' infrared heater from Switzerland to warm up juice if necessary to finish fermentation.

In '81, Lett did trials with whole berry fermentation which are waiting for analysis. "For a red wine to age, you need tannin or acid, we have good natural acidity, therefore no need for stems," says Lett.

Ponzi crushes all grapes into 200 gallon fruit boxes with 60 ppm SO_2. In '82 Ponzi planned to put some grapes into an open top stainless steel fermenter. Having experienced some H_2S problems with Montrachet yeast, Ponzi now uses Assmanshausen yeast which tolerates high temperatures well and has never developed H_2S.

Two or three days after inoculation, vigorous fermentation begins. Punching-down is done by hand, three or four times each day, until dryness is reached; total time from inoculation to dryness is about 10 days.

Ponzi has experimented with the addition of stems. In '79, he made Pinot Noir from both Washington (under the Salishan Vineyards label) and Oregon grapes with 30% stems in the Washington wine, none in the Oregon lot. In '81, he added 30% stems to each lot of Oregon grapes.

In '82, Ponzi's plans were to add only 10% stems and increase whole berries to 20%. Ponzi says, "Stem addition—whether or not and how much—should be determined on familiarity with the particular vineyard's grapes as well as the peculiarities of the year's harvest."

At **Oak Knoll**, all grapes are crushed with 50-70 ppm SO_2 into open redwood tanks which hold five to six tons and no stems are added. Vuylsteke uses Montrachet yeast to achieve more character than Champagne offers, and by keeping the wine clean and racked, has had no real problem with H_2S.

A plastic sheet is loosely tied over the top of the redwood tanks to retain the volatile flavors that condense and **fall back as the inside temperature is cooler than outside**

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the tank. The loosely tied sheet does allow the volatile sulfurous compounds to escape, and pumpover is done three or four times a day for one-half hour, pumping at 100 gallons/minute.

Temperatures peak about 85-90° F during the 12-14 day period until dryness is reached. The cap is allowed to fall into the wine to give the wine extra tannin.

Yakima Valley is 200 miles from the **Associated Vintner's** winery. Grapes are picked into four foot by four foot by twelve or sixteen inch deep boxes and loaded onto a truck for overnight delivery to the winery.

Grapes are crushed the next morning with 40-50 ppm SO_2 into 500 gallon fibreglass vats. Inoculation with Champagne yeast which produces a vigorous, warm fermentation is done 24 hours later.

Punching-down is done twice a day from the day of inoculation through the average ten day fermentation, plus one or two days of mixing pomace and wine before pumping to the press.

Lake suggests hanging pest strips near the fermentation vats to catch all the fruit flies during the first several days of fermentation. This has eliminated their fruit-fly problem.

Lakes notes, "Pinot is normally deficient in tannin, I will add stems if the juice can take it. I look at the ripeness and size of berries and cropload. If a juice is light and thin I will not add stems. In '79, I did add 50% stems to give more tannin to the wine."

Fermentation in '79 peaked at about 90° F for good color extraction. Free-run wine through the Vaslin press and first press wine are mixed together while the remaining press wine is kept separate.

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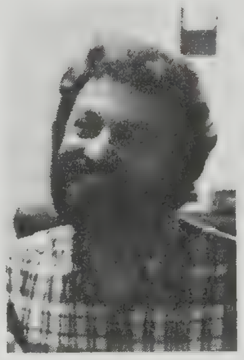
All grapes are crushed at **Knudsen-Erath** and sound grapes receive no sulphur; grapes that have deteriorated, do receive sulphur. Epernay yeast is used for a slower, less violent fermentation. Pumping over of about 30 minutes occurs five times a day in the 3000 gallon closed tanks which have jackets to be used to hold the temperature at no higher than 85° F.

Fermentation takes about seven days and about two days later when the wine has dropped to 75° F or just before the cap falls, the wine is racked and pressed.



> *'Bottle ageing is of tremendous importance in our Pinot Noirs.'*
>
> —**Dick Ponzi**

Erath has tried stems, but did not find much improvement in the wine. "As the vines get older, we get more tannin, more depth and complexity," says Erath.

At **Amity,** fruit is crushed with 70-100 ppm SO_2 into open tanks and covered with a plastic sheet. About two pounds/1000 gallons of dry Champagne yeast is added. Redford likes to have fermentation between 80-90° F and will warm up the juice to 80° F. 10-25% whole berrys are added to prolong fermentation.

Punching-down is done four to six times per day over 10 to 14 days. Skin contact is maintained until the cap drops in at about 1-2° Brix to achieve maximum extraction.

Depending on the vintage, a higher sugar juice may receive 0-100% stems to increase the body and tannin level. Redford notes that the Gamay clone produces lower tannin and high acid, while the Wadenswil clone produces higher tannin and lower acid and ripens earlier.

How is malolactic fermentation and barrel ageing conducted?

At **Ponzi Vineyards,** free run and press wines are kept separate until blending, following barrel ageing. The wines are put into tanks for about two weeks of settling after racking and pressing. Wines are then gravity fed to barrels, and the balance pumped. First racking occurs by the end of the year and barrels are topped every two to three weeks.

The wines pick up malolactic bacteria already present in the barrels, and malolactic fermentation finishes during the spring and early summer. Wines are racked upon completion of malolactic and the SO_2 is adjusted to 15-20 ppm.

Actual length of subsequent barrel ageing depends on the wine itself—fruit intensity, age of the barrels, and type of oak. Barrel ageing may extend 12 months past the second racking, still being topped every two to three weeks, more frequently, if the weather turns exceptionally hot and dry.

Ponzi has barrels of Nevers, Limousin, Allier and Troncais from Francois Freres and Tonnelleries de Bourgogne

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to give him flexibility at blending. New barrels are purchased each year to provide a mixture of ages, and after five years of use, the barrels are shaved.

At **Eyrie**, press and free run wines go into barrels separately with about 2° residual sugar. The sugar is gone within a week or two, and the wine is racked twice more before the end of the year.

Malolactic bacteria is in the winery and the malolactic fermentation will start when the wine is as cool as 45°F and pH as low as 3.2. Malolactic often completes with primary or by the late spring.

The fourth racking of the wine occurs in March or when malolactic has completed. Depending on the humidity in the cellar, topping is done every two to four weeks. Two rackings occur during the second year of barrel ageing.

Lett has used Limousin barrels from Tonnelleries de Bourgogne and Francois Freres and possibly because of the low alcohol, is still getting extraction in the tenth year of use before shaving. Years ago, Lett tested Limousin, Troncais, Nevers, and American oaks and has preferred Limousin. In '82, Lett ordered two barrels each of the above (except American) plus Allier and Bourgogne, to try.

'I have found that Oregon fruit loses color as it ripens—high pH gives you low color.'

—**Myron Redford**

Free run and press wine go into barrels together, where the malolactic bacteria is present, at **Elk Cove.** First racking occurs in two to four weeks and the wine is topped every 10 to 14 days. Second racking occurs after one to two months and malolactic fermentation is usually completed about August. The wine is racked and adjusted to 20 ppm SO_2, returned to barrels and topped weekly.

Campbell likes a mixture of different age barrels and has about 40% Allier, 40% Nevers, and 20% Limousin, and prefers the coopers; Francois Freres and Tonnelleries de Bourgogne. Campbell removes the wine from barrels usually after 15-18 months.

At **Knudsen-Erath**, when the temperature of the fermenting juice starts climbing and can support malolactic fermentation (usually between 12-15° Brix), malolactic bacteria from a natural strain isolated at the winery in '73 is added. Depending on the malic acid content, malolactic may complete at the end of primary fermentation, or finish in the barrels, which are maintained in a room about 50-55°F.

Press and free-run wine are put in tanks together to settle out the yeast over two to three days. A coarse DE filtration is done prior to putting the wine into barrels.

Barrels are topped once a month, and the SO_2 is adjusted in May to about 30 ppm. Topping then occurs twice a month, which is a minimum due to use of latex rubber bungs, which reduce the need of topping. Wine is removed from barrels in July or August of the first year depending on oak extraction.

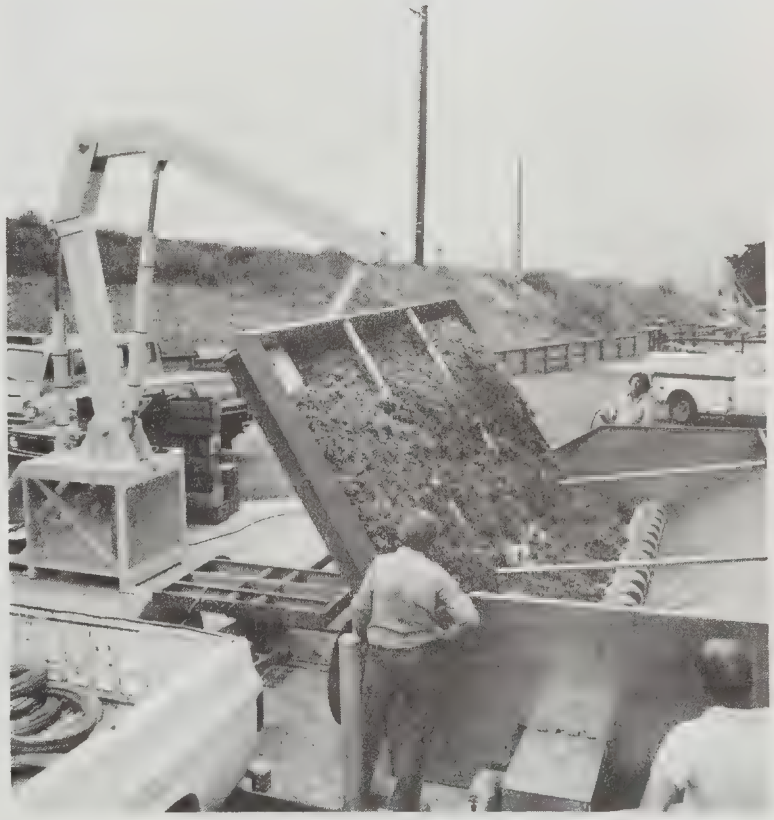
Erath has tried many French oaks, he likes Allier from Tonnelleries de Bourgogne, as it is tighter grained, allowing less extraction and has nice character to complement Pinot. Barrels have been added each year and eight-year-old barrels will be shaved in '83, and Erath hopes to retoast them with a medium toast.

Free run and press wine at **Amity** are settled together about seven days after pressing, racked and settled 30 days before racking to barrels.

Redford also makes a nouveau Pinot Noir, usually from eastern Washington grapes. the pH of those grapes and carbonic maceration create spontaneous malolactic, some of which is used to inoculate the Pinot.

If the wine has not completed malolactic when pumped to barrels, the barrels are blanketed with CO_2 before filling. Barrels are topped every four weeks until malolactic has been completed. The wine is then racked and the SO_2 adjusted to 20-25 ppm, and returned to barrels for another nine-to-twelve months.

Redford likes Allier and Limousin barrels with medium to heavy toasting and a small amount of American oak barrels. Barrels are shaved after five or six years, and the wine is aged in a mixture of young and old barrels. Wines are aged from six to 18 months, with most wine receiving nine to twelve months time in barrels.



A HYDRAULIC HOIST at Vichon Winery, Oakville, CA, is being used instead of an overhead cable hoist to dump all types of grape gondolas and bins. Anchored by only six bolts, the hoist was easily moved from the previous winery sight in St. Helena, CA. The seven ton capacity hoist can be moved easily by rollers or forklift to a different site for other uses. More information on the unit is available from the manufacturer, Winery Equipment Systems, Napa, CA, or fill in PW reader response card.

After pressing at **Associated Vintners,** the wine is allowed to settle four to five days in tanks during which it is inoculated with ML-34. Wine is racked to American oak barrels (recoopered whiskey barrels from Sweeney's Cooperage in Vancouver, British Columbia). "American oak barrels do have strong flavor and must be watched closely; they give me a satisfactory combination of barrel ageing quality with a very light oaking," says Lake.

AV's wine is topped every two weeks and the first racking is done upon malolactic completion, usually sometime in the spring. When the wine is racked, the SO_2 is adjusted to 25 ppm. Topping continues every two weeks. The second racking usually occurs before the new harvest and the third racking in December.

Barrel ageing at AV averages 18-19 months. "I watch to make sure the wine does not dry out and lose its fruit, intense fruity wine can take more barrel ageing," says Lake.

At **Oak Knoll,** free run and press wine are settled in separate tanks for four to five days, and then racked to barrels which contain malolactic bacteria. Barrels are topped every one to two weeks and the first racking occurs after malolactic completion. SO_2 is adjusted to 20-30 ppm at the first racking. Second racking occurs about six months later.

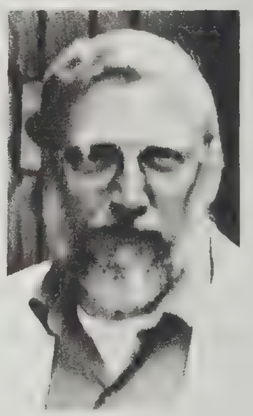
Barrels of Allier and Limousin are used. "Pinot Noir needs oak, Allier is over-powering, gives a sweet finish and Limousin had a hard character. The two make a good marriage and add nice oak character to the wine," says Vuylsteke.

How is the wine finished?

At **Elk Cove,** the minimum done to the wine is rough filtration. The most would be a moderate filtration after egg white fining, which might be done on a wine that is too coarse and tannic from stems. Wine is bottled with 30 ppm SO_2. Campbell suggests a minimum of one and one-half years of bottle age, and finds more bottle age is better.

Oak Knoll gives the wine a DE filtration prior to blending and a tight pad filtration ahead of the filler bowl, before bottling with 20 ppm free SO_2. Wine is held in bottles six months to one year before release and is ready to be consumed in two or three years.

> *'Pinot Noir needs oak, Allier... Limousin... make a good marriage and add nice oak character..."*
>
> —Ron Vuylsteke



Lett at **Eyrie** says, "I never filter or fine the wine, because I do not want to pump the wine. I push the wine with nitrogen during racking and to the gravity feed filler. If the wine is smelling reduced, or the wine needs some air, I will use a pump. I bottle with 20 ppm SO_2 and recommend three to four months bottle age minimum, but that is not real necessary. The '70 vintage has yet to mature. I believe most vintages will age 10-20 years."

Ponzi wine receives egg white fining and no filtration. Final blends are made between free run and press wines of the individual vineyards and clones, aged in different oaks. Wine is bottled with 25 ppm free SO_2.

"Bottle ageing is of tremendous importance in our Pinot Noirs," says Ponzi. "At bottling the wine is of course 'nice;' then, after even six months, it starts to get *really* interesting. From then on, the wines are good for years . . . the '74 is still improving!"

At **Knudsen-Erath,** the wine is fined with gelatin to remove tannin, or egg whites if tannin removal is not needed. A medium DE filtration is done prior to bottling with 30 ppm SO_2 free.

"We like to bottle age Pinot more than barrel age it. We hold Pinot in the bottle at least a year. Pinot is on a rollercoaster in the bottle during the first two years, it throws quite a bit of sediment by the end of two years. Our '73 is nine years old and a super wine!" adds Erath.

Blending trials are done at **Amity** to determine the regular and reserve blend. A rough DE filtration is given to the wine prior to bottling with 30 ppm SO_2. Redford likes at least six to twelve months bottle age on the regular lot and 18 to 24 months on the reserve.

Pinot at **AV** does not normally receive fining, the wine is racked from barrels to a tank, given a rough pad filtration and bottled with about 25 ppm free SO_2. AV's policy is to bottle-age wines approximately two years. A light Pinot—less time; a big one—more time. Lakes projects Washinton Pinot to mature at about five to seven years and plateau for awhile. ■

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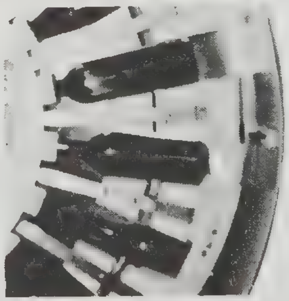

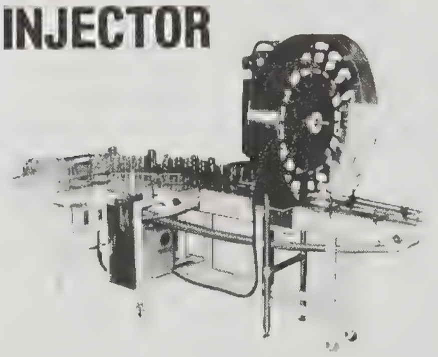

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- Line space of only 25" to 40" depending upon line speed.
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PINOT NOIR WINEMAKING SUMMARY

WINERY	HARVEST CRITERIA	YEAST	STEMS IN FERMENTATION	PUNCH-DOWN or PUMP-OVER	MALOLACTIC BACTERIA INTRO.	COOPERAGE LENGTH OF TIME	FINING or FILTRATION
Amity Myron Redford	3.3 or lower pH 18-22.5° Brix 0.8-1.1 acid	Champagne	0-100%	Punch-down 4 to 6 times/day	inoculated	Allier Limousin Amer oak 6-18 months	DE filtration
Associated Vintners David Lake	22-23° Brix 0.8-0.96 acid 3.2-3.4 pH	Champagne	0-50%	Punch-down twice a day	inoculated	Amer whiskey 18-19 months	rough pad filtration
Elk Cove Joe Campbell	23-24° Brix 1.0+ acid 3.0-3.7 pH	Assmanshausen	75-100%	Punch-down 2 to 3 times/day	pick-up in cooperage	Allier Limousin Nevers Nevers 15-18 months	rough or moderate filtration after possible egg white fining
Eyrie David Lett	maturity	Champagne	none	Punch-down every 2 hrs during peak of fermentation	pick-up in cooperage	Limousin	none
Knudsen-Erath Dick Erath	3.1-3.2 pH 20.5-22.5° Brix 1.0-0.85 acid	Epernay	none	Pump-over 5 times/day	inoculated	Allier 10-11 months	gelatin or egg-white fining medium DE filtration
Oak Knoll Ron Vuylsteke	0.95-1.0 acid ±21° Brix	Montrachet	none	Pump-over 3 to 4 times/day	pick-up in cooperage	Allier Limousin	DE and tight pad filtration
Ponzi Dick Ponzi	21-23° Brix 0.9 acid	Assmanshausen	0-10%	Punch-down 3 to 4 times/day	pick-up in cooperage	Allier, Limousin	egg white fining Nevers Troncais

St. Clement barrel storage

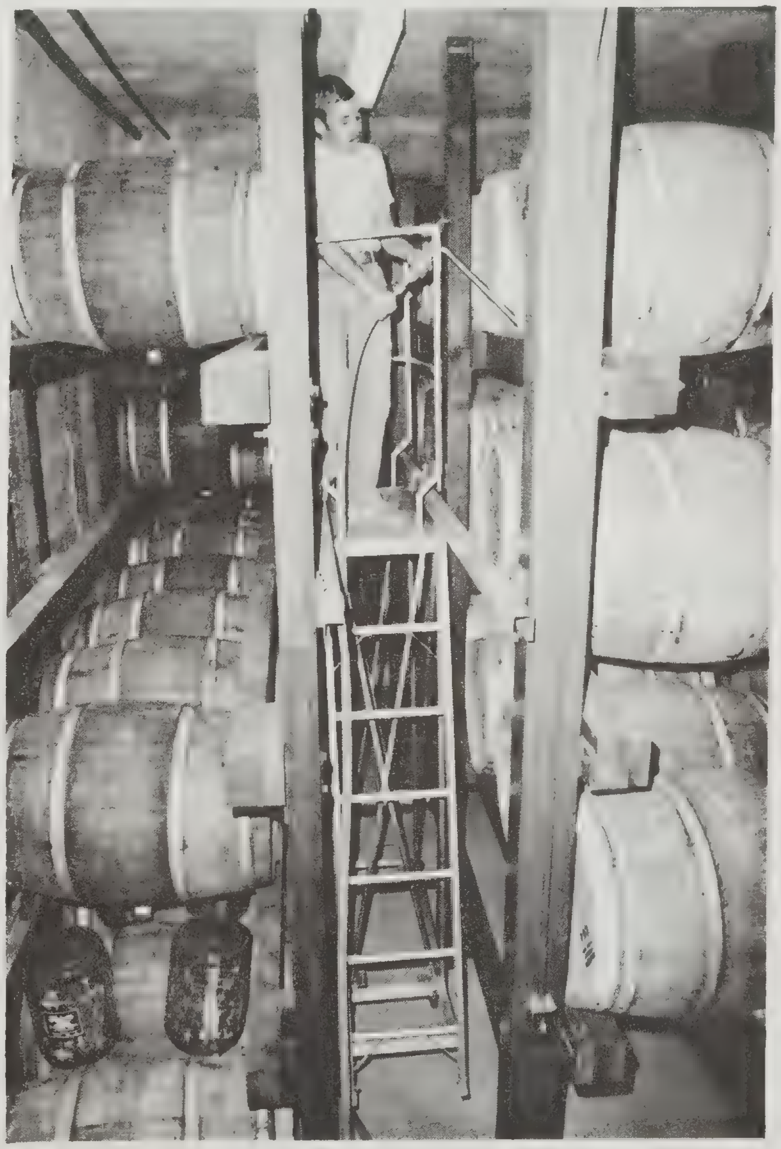
Dennis Johns, winemaker at St. Clement, St. Helena, CA, has a very compact barrel room with 280 barrels in seven tiers. Access to upper level barrels is provided by an aluminum ladder platform which rides on rails attached to the wooden barrel rack structure.

Weighing approximately 75 pounds, the platform can be pushed or pulled by the winery worker while on the platform. The 20-inch base platform is very stable and can be moved by two people to a new row and hooked up to the upper rail which carries the platform. A lower rail serves as an aligning, stabilizing bumper.

Requiring no maintenance, the platform also does not obstruct light.

"It works like a library ladder, letting a person work to the right, left, forward or backward," says Johns. "The platform allows the worker to be safe at heights and comfortable; insuring better conditions for the worker to do a better job of racking and topping."

H-B Enterprises in St. Helena, CA, built the platform to Johns' design.



Ahlstrom Redesigns Coq Press Cylinder

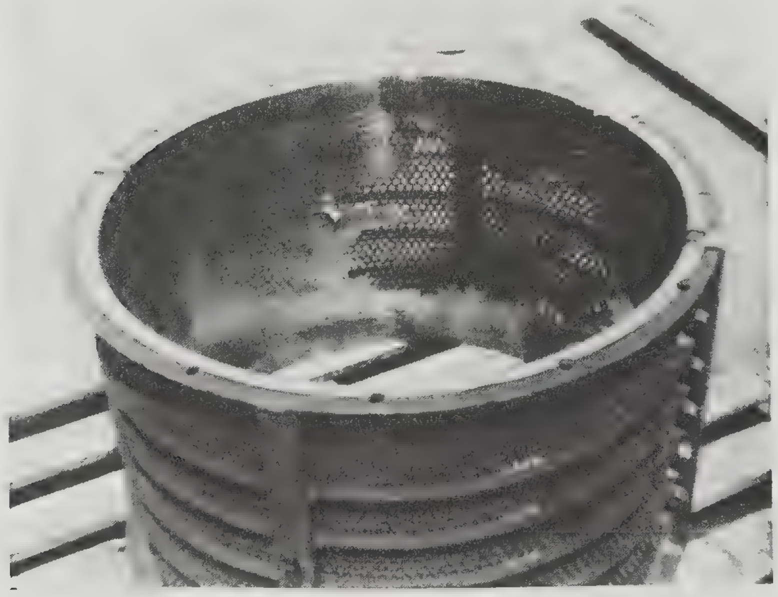
A redesigned Coq press cylinder has been developed by Ahlstrom Machinery Inc., offering improved wear and an increase in capacity. First delivery of the cylinder was made to a California winery before the '81 crush.

Myles Fitzgerald, manager of technical services at Ahlstrom in Glen Falls, New York, describes the design improvements.

"The old first stage cylinder in a 800 mm Coq screw press was made in two halves out of mild steel and had two overlapping screens; an inner screen, one mm thick, and an outer screen, 4.7 mm thick, both with punched holes one mm in diameter.

"Our new design is one continuous screen replacing the two halves, made out of the stronger #316 stainless steel. The new five mm thick screen has conically drilled holes, 1.3 mm, diameter.

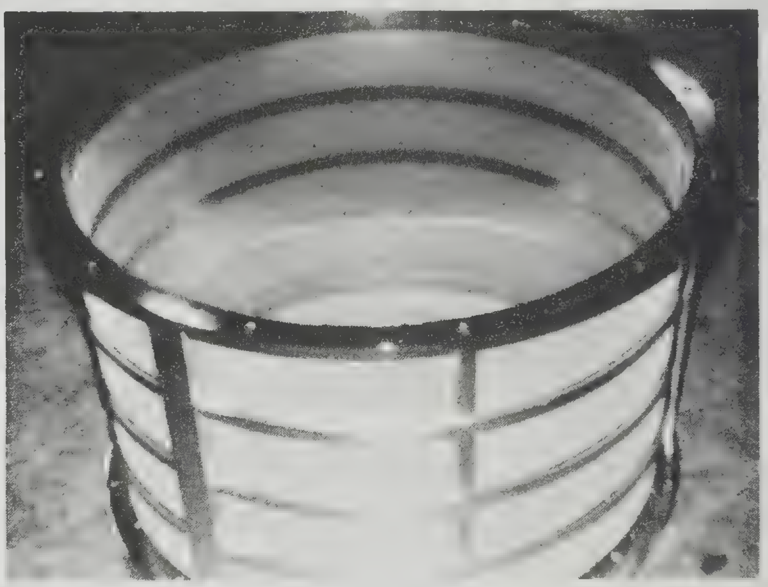
"Advantages of drilled holes over punched are two: the drilling process leaves much less stress in the screen from manufacture, and holes can be drilled closer than in punching, giving more open area.



"Due to the greater strength of the single, thicker screen, we were able to reduce the number of reinforcement rings, which cover up usuable screen area, from four to three.

"The combination of larger and more holes, one less reinforcement ring, and the elimination of the two overlapping screen surfaces, gives the user an effective open area of 26.6%, whereas the previous design had an effective area of 11.6%.

"The accompanying photograph shows where the old inner screen has worn away. The photograph of the new screen shows the single piece construction and increased surface area due to elimination of one reinforcement ring."



Fitzgerald can be reached for more information by phone at (518) 798-9541, or by mail to Ahlstrom Machinery Inc., PO Box 74, Glen Falls, New York 12801. ■

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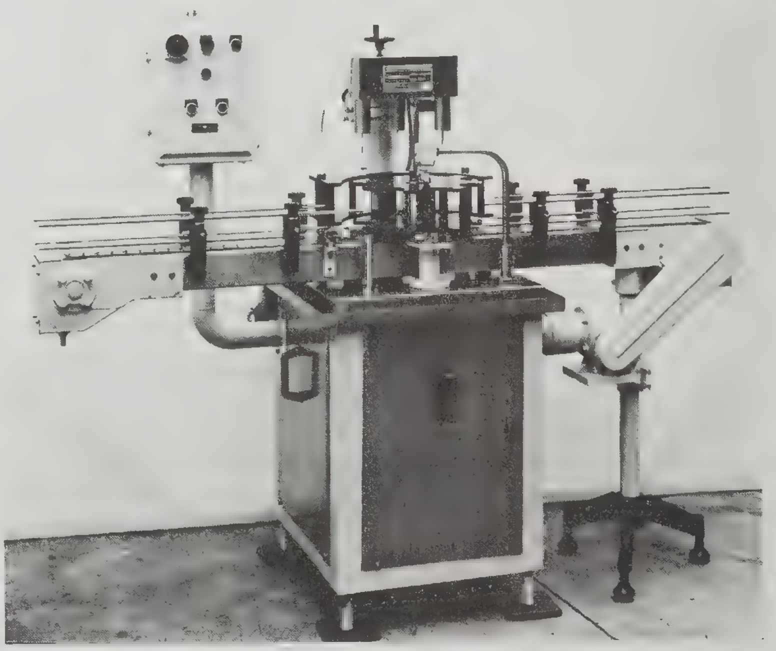


RONCHI INC. USA introduced an automatic sparger in 1982 for under $10,000 to wineries in the USA. The system features a high pressure air-blast followed by simultaneous evacuation, removing all dust and debris, and an individual stainless steel tube which extends down into the bottle to inject the proper amount of nitrogen. Several wineries now have the unit in place on their bottling lines. The manufacturer has over 35 years experience in building wine-making equipment and offers direct factory prices. New mobile field trucks provide fast, efficient repair and part-replacement services. For further information, call Ronchi toll-free (800) 323-0672, or fill in PW reader response card.

EDUCATION AND RESEARCH

By GLENN WITHIAM

The recent growth in the U.S. wine industry has matched that of consumer demand for wine as the American palate has developed. Yet the expense of that growth in the form of costs for training staff has been borne almost exclusively by the wineries, wholesalers, retailers and restaurants.

Two years ago Tompkins Cortland Community College in Dryden, N.Y. inaugurated a wine merchandising program to meet the need for trained personnel within the industry. Representatives of New York-based wineries such as Taylor, Widmer, Wagner and Glenora worked with Hushang Bahar, president of the college, to develop this option to the college's existing business administration program.

As in other states, New York's wine industry is comprised of many companies—large established wineries such as Taylor, smaller and newer wineries like Wagner and many different wholesale, retail and restaurant outlets. To serve this varied clientele, the college needed to create a flexible program, a structure made possible by the college's basic policies. Tompkins Cortland encourages students to pursue their studies both full and part-time, by taking day or evening classes.

The wine merchandising program maintains this same type of flexibility. Individuals who are already in the wine marketing industry, whether at the winery or the retail store, can take the specific courses which will benefit them. They can complete the two-year Associate in Applied Science degree if they wish but they are under no obligation to do so.

The program's objective is to provide a person with a complete technical knowledge of the process of making and marketing wine. In this way, Tompkins Cortland Community College will be able to supply trained persons to fill these positions in this expanding industry.

Among the courses offered are "Survey of Beverages," an introduction to wine, beer and other spirits, covering the presentation, use and control of these products; and "Wine Tasting and Sensory Evaluation," which directly compares wines from various parts of the world. The students are given an opportunity to taste how climate, soils and other factors influence the wine.

Study of how grapes are grown and wine is made is the focus in "Viticulture and Enology" while the many distribution channels of bottled wine from retail store to restaurant are covered in "Wine Merchandising." In the merchandising course, students learn specific marketing techniques for each point of sale.

The specialized program is rounded out with a "Wine Merchandising Internship" in which students are placed at business sites within the industry. This could be at a winery, retail store or restaurant.

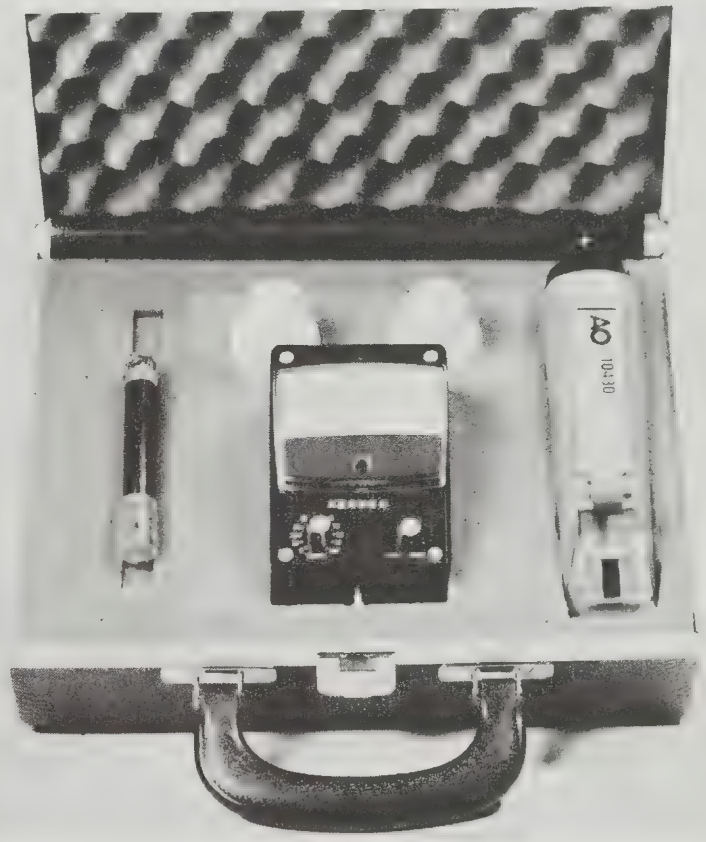
The curriculum is strong in business courses, because knowledge of wines is not sufficient to operate a business today. The business curriculum covers the entire range of needed skills: accounting, salesmanship, marketing, business law and advertising. For students who wish to complete the two-year degree, courses in composition, economics, science and psychology are also required.

The college uses both its own full-time staff, as well as, experts from the nearby Colleges of Hotel Administration and Agriculture and Life Sciences at Cornell, as well as, the wineries themselves to teach the courses in the wine merchandising program. This mix, college officials feel, gives the students a chance to gain the broadest possible overview of the field.

To date, 20 students have entered courses in this curriculum. That number is expected to increase, however, as upper level courses are added.

Located in upstate New York, the college is well-situated to provide this type of program for the Finger Lakes wine industry. The college has an enrollment of 3700 students in 25 different two-year programs. Its purpose specifically states that the college will offer those degree programs and courses that directly benefit its community. The wine merchandising program is a part of that commitment.

(Glenn Withiam is director of community relations for Tompkins Cortland Community College, 170 North St., Dryden, N.Y. 13053.) ■



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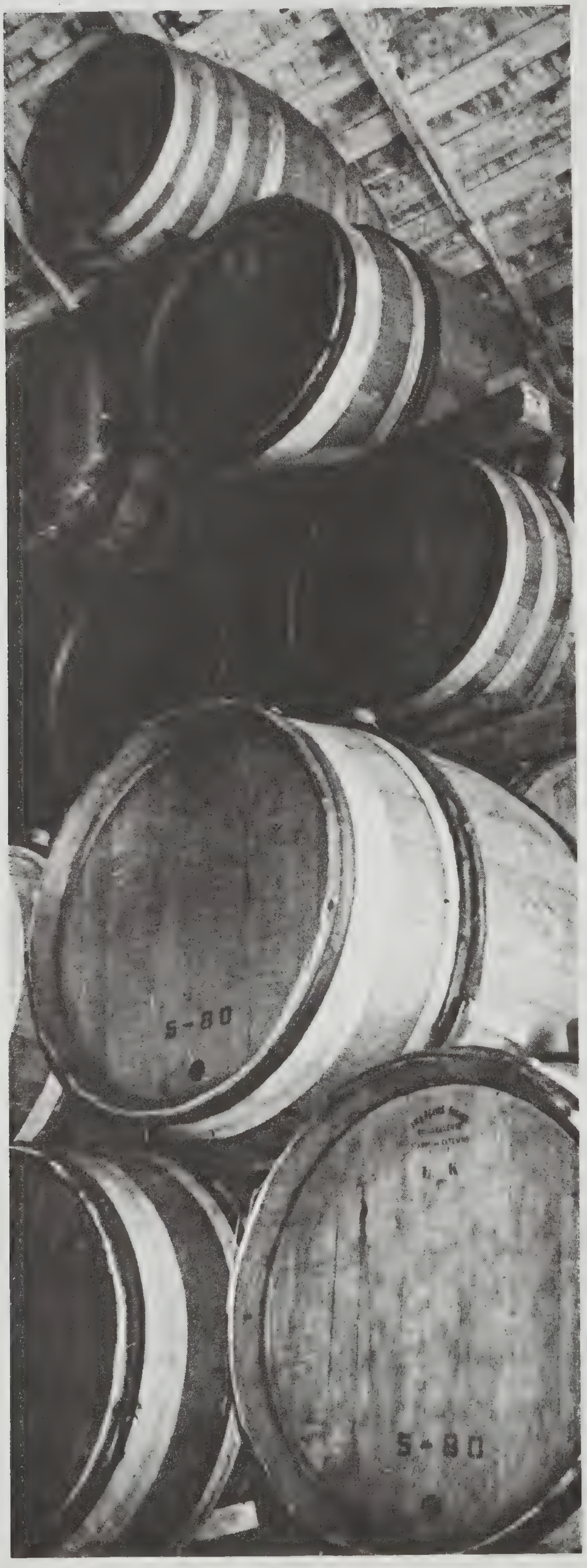

By DENIS KELLY

Over the last few years a new wine style has emerged in California: Vintage Port.

Sweet, fortified red wines, of course, have been made in the state for years and some have been labeled Port. Most were indistinguishable from the vast ocean of sweet, high alcohol wines that were once the mainstay of the wine industry, although some of these blended Ports achieved a lasting reputation.

Ficklin Vineyards of Madera is the best known maker of good, blended Port and wineries like East-Side, Paul Masson and others have gained a name for sound and well made Tawny and Ruby Ports.

In 1975 a few winemakers in California began to make sweet red fortified wines in the Vintage Port style. These wines are made in the classic Portugese manner: relatively high sugar grapes are partially fermented and fermentation is arrested with high proof or brandy. The wines are aged in wood for a relatively short time (1-2 years) and then bottled. They are usually vintage dated and are usually made from North Coast or Amador County Zinfandel or a blend that includes Zinfandel, Cabernet Sauvignon and Petite Sirah.

I talked recently with some of the best known producers of California Vintage Port about the question of small oak aging.

RUSS WOODBURY,
WOODBURY WINERY, SAN RAFAEL

"Russ, you've been specializing in Vintage Ports over the past few years, what's your feeling about small oak cooperage? Does your choice of barrel type have an influence on the style of the Ports you make?"

"In Portugal, each house seems to use a different kind of wood: Taylor uses Yugoslavian, Coburn uses largely French, others use Spanish and some import Polish barrels. It's really a crazy quilt of barrel types. Most houses put their Ruby Port into new barrels and use the barrels for about 5 years to leach out the wood tannins and harsh flavors. After the barrels are pretty much neutral in flavor, they'll put in the Vintage Ports. What they're looking for is just the oxygen reduction, not wood flavor or character.

"I use scraped brandy barrels and I'm not looking for any definite wood character. I give them a hot soda ash treatment to make them even more neutral. I want the flavor of the fruit to come through without oak flavors and just use the barrels for the reduction effect.

"I usually age my Ports about 24 months on the average, although this will differ from wine to wine. I top off and taste each barrel at least every 3 months and judge how it will fit into the master blend. That's the determining factor: building the master blend.

"We're making 4 different Ports now: a vintage blend of Cabernet, Zinfandel, Petite Sirah and Pinot Noir and varietal Ports from Pinot Noir, Zinfandel and Petite Sirah. I don't treat them very differently in the barrel. The differences are varietal and don't really depend much on the influence of the barrel.

"One big difference, though, is the cost. Used brandy barrels cost about $40 each these days and that sure helps to keep the price of the wine down on the shelf. I get the barrels from Sal De Bella on Harrison St. in San Francisco and have had pretty good success with them. I think the brandy barrels work very well with my style and definitely further the Ports' development."

PETER BREHM, BERKELEY WINE CELLARS, BERKELEY

Another well known maker of Vintage Ports is Peter Brehm of Berkeley Wine Cellars. When asked how small oak cooperage fits into his Port-making philosophy, Peter said:

"My Port-making is non-traditional. You could say that I'm making something more like a sweet, high alcohol Bordeaux than a traditional Oporto. In Portugal they emphasize the fruit and brandy flavors with the barrels way down the line. I like to use the barrel as an element in the composition of the wines and think that the oak flavors lend complexity.

"I prefer Yugoslavian and French oak. I don't much like American oak for Port. The Yugoslavian and French oak seems to integrate better into the wine. The American is too aggressive and stands out.

"The idea with oak is to try to get something that will blend and marry with the wine so that you can't see the line between the fruit and the wood. European oak is more subtle and blends in a positive way. It's difficult to see the marriage line and it's less blatant than American oak. Yugoslavian oak works really well in Vintage Port. It has a certain amount of tannin and flavor and contributes cedary components to the wine. American oak comes out with heavy flavors and odors that are just too much for the wine, a definite Vanilla aroma dominates the fruit.

"I think oak should be a part of the total complexity of the wine, but shouldn't take over."

ANDY QUADY, QUADY WINERY, MADERA

Andy Quady of Quady Winery in Madera has made a number of excellent Vintage Ports in the last few years, largely from Amador County Zinfandel. When asked about oak he said:

"So far, I've been using American oak brandy and whiskey barrels, unscraped but this year I'm going to try some French oak. I don't really like the American oak flavor that well, although if it's not too intense, it can be OK.

"A few of my wines like the 1978 and 1979 have a bit too much oak flavor. American oak can have too much harsh tannin. And too much of the American oak aromas in the nose can sometimes interfere with the fruit.

"This year I'll be experimenting with some French barrels and I'm really interested in seeing the results. I'm hoping the French oak will work more in the background.

"Certainly, some oak flavor is needed to give the wine complexity. Taste wines that have been in old brandy barrels with all the flavors leached out after 15 or so years of use. Compare these wines with ones that have been in newer barrels and you can taste and smell the difference. Just think what a Port that was aged only in stainless steel would taste like. Simple and probably pretty dull.

"The barrel contributes a background, a complexity, but it should stay in the background. American oak has too

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much intensity and can overpower the wine quickly.

"More neutral American oak can provide a background, but the tannins are still too harsh. I do like some of the American oak aromas with Zinfandel Port but the tannin levels can still be quite high.

"This year I'll be making wines using the Portugese varieties we've planted up in Amador County. We'll be harvesting Touriga, Tinta'cao, Bastardo, Alvarelhao and Mourisco preto. I'm interested to see how these grapes turn out and I'll probably put the wines into French oak.

"This is a real 'Oporto' vineyard by the way. It's on the western edge of the valley and it's planted on a steep and rocky slope with a southwest exposure. It's about as steep as you can get and still use machinery. But it's still not like Portugal. They wouldn't even consider it a slope over there.

"The size of the barrel makes a difference, of course. In Portugal they use 140 gallon pipes (the traditional Port barrel), and the larger barrel will give you less extract. Wood does seem to be a part of the style of Portugese Ports, especially the Vintage Ports, and even with the Old Tawny Ports. Even though these go into older barrels, there is still a limit to the time they can spend in the wood. After about 20 years or so, they really start to taste oaky, no matter how "neutral" the barrel.

"I just got a new barrel rack, steel with wooden rails, that will give me a lot more cooperage capacity. I can stack barrels 6 high with 5 French or 6 American barrels deep. The nice thing about it is that you can get to leaky barrels easily. My rack will hold 288 barrels and measures 12' x 40' x 18' high. It was built by Rackshelf of Fresno which also built racks for Inglenook and Beaulieu.

"So, I've got room for plenty of barrels and I'll be experimenting with various types of French barrels to see how they interact with the new Portugese grapes and the Amador Zinfandel I've used in the Vintage Port over the last few years." ■

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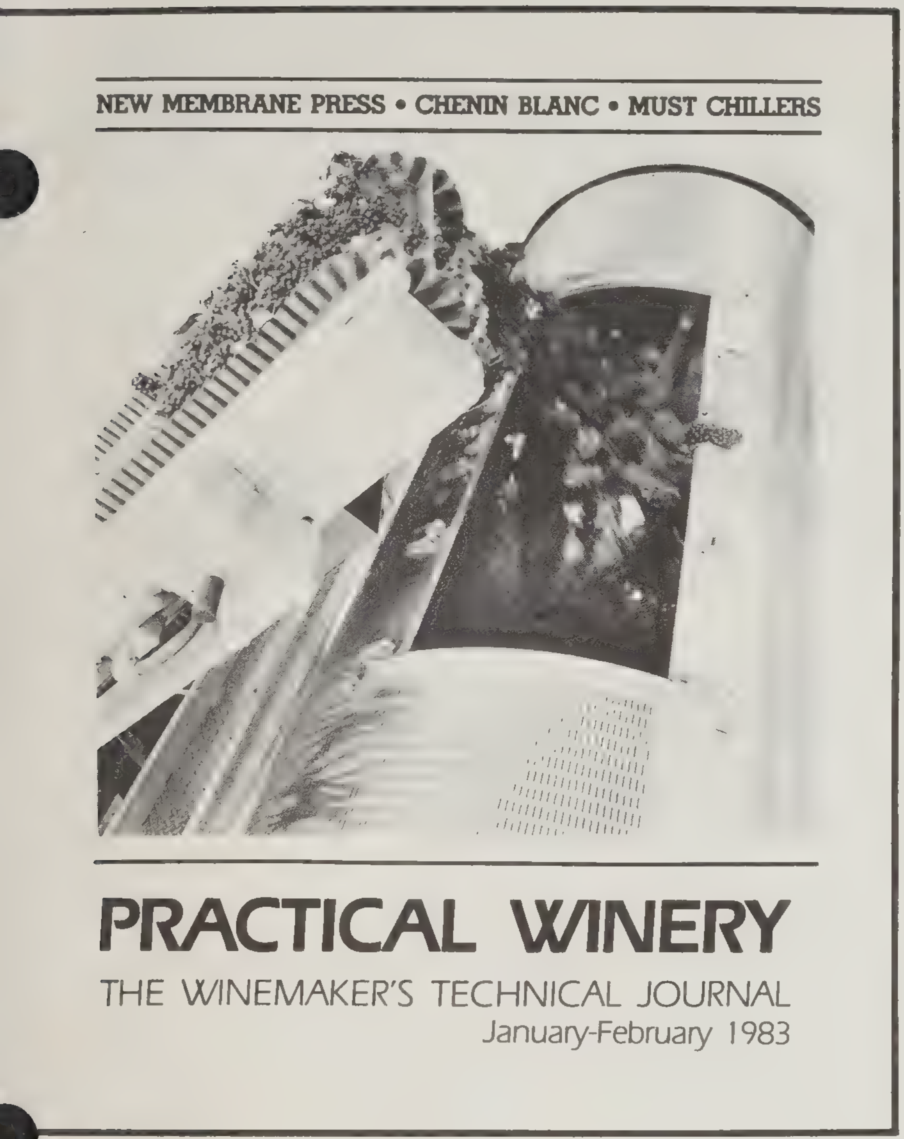

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